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ABSTRACT

This activities book for the middle elementary grades is the third book of a series of six books designed to provide developmental K-12 experiences designed to support the basic environmental philosophy of spaceship earth presented in Book 1. The aims of the four activity sections of this book are to aid in developing students to make them more sensitive to their environment, able to recognize problems, reach a sophistication in using problem solving skills, and inclined to participate in action activities to deal with environmental problems. The Concept Development Activities Section was developed to assist teachers in assisting students to further their understanding of major concepts basic to the development of an environmentally literate citizenry. These concepts are: ecosystem, population, economics and technology, environmental decisions, and environmental ethics. The Skill Developing Activities Section identifies eight skills as being essential to the environmental problem solving process. For each of the eight skills, skill developing activities have been designed. The Values Clarification Activities Section contains sample strategies that teachers have found helpful in assisting students to clarify their values regarding environmental issues. The Environmental Encounters Activities Section contains a series of school-community environmental problem solving activities. (BT)

ENVIRONMENTAL EDUCATION ACTIVITIES MANUAL

William B. Stapp
Dorothy A. Cox

MIDDLE ELEMENTARY ACTIVITIES

ENVIRONMENTAL EDUCATION ACTIVITIES MANUAL

Book 1: CONCERNING SPACESHIP EARTH

Book 2: LOWER ELEMENTARY ACTIVITIES

Book 3: MIDDLE ELEMENTARY ACTIVITIES

Book 4: UPPER ELEMENTARY ACTIVITIES

Book 5: JUNIOR HIGH ACTIVITIES

Book 6: SENIOR HIGH ACTIVITIES

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PREFACE

This grade level activities book is one in a series of six books which provide developmental K-12 experiences designed to support the basic environmental education philosophy of spaceship earth.

The educators who use this activity book are encouraged to thoroughly acquaint themselves with the philosophy, model description, implementing guidelines, and resource opportunities in Book 1.

The aim of the four activity sections of this book is to aid in developing students more sensitive to their environment, who are able to recognize problems, reach a sophistication in using problem solving skills, and are inclined to participate in action activities to deal with environmental problems.

The following pages include only a sample of activities meant to suggest a host of possible spin-offs. To be most effective they will most probably need to be altered to fit individual situations and student backgrounds.

William B. Stapp
Dorothy A. Cox

August, 1974

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Middle Elementary Concept Developing Activities

SECTION I

Concept Development Activities

The following Concept Development Activities were developed to assist teachers in assisting students to further their understanding of five major concepts basic to the development of an environmentally literate citizenry.

The five major environmental education concepts are: ecosystem, population, economics and technology, environmental decisions, and environmental ethics.

For each of the five concepts, specific understandings have been identified as appropriate for lower elementary, middle elementary, upper elementary, junior high, and senior high. Two activities have been developed for each understanding to assist students in furthering their understanding of each of the five concepts. The activities were also designed to enrich existing subject matter.

The concepts, understandings, and supportive activities that have been developed are listed on the following pages of this section.

Concept: Ecosystem

Understandings:

A. Lower Elementary (Kdg, 1st & 2nd)

1. The earth can be thought of as a "spaceship," containing all of the air, water, and land we will ever have.

2. The sun is the basic source of energy for all life in every ecosystem.

3. Plants capture sunlight and use it to help them make the food and oxygen that people and other animals need in order to live.

4. Some animals eat other animals which in turn eat plants; some animals (like people) eat both plants and animals.

B. Middle Elementary (3rd & 4th)

1. An ecosystem consists of all the plants and animals in a given area interacting with each other and their non-living environment.

2. The interaction of plants, animals and their non-living environment form many cycles in an ecosystem (carbon or food cycle, mineral cycles, water cycles, etc.).

3. Some of the sun's energy has been stored in coal peat, petroleum, natural gas, and other fossil fuels.

C. Upper Elementary (5th & 6th)

1. There are different forms of energy (i.e. light, heat, electricity, food, etc.).

2. Energy is neither created nor destroyed, but can be changed from one form into another.

3. With each transfer of energy (i.e., food chain) within an ecosystem, some energy is lost (mainly as heat energy).

4. Humans frequently, knowingly and unknowingly, waste energy.

D. Junior High (7th & 8th)

1. Anything added to the environment which accumulates in sufficient quantity to be unwanted by someone is pollution.

2. Too much pollution normally results in damaging the environment.

3. Natural cycles and systems have limited capacity to cycle or disperse pollutants.

4. Humans and natural resources are distributed unevenly around the earth.

E. Senior High (9th, 10th, 11th & 12th)

1. An ecosystem is complex and is vulnerable to sudden or long-term disturbances.

2. Human beings are capable of strongly altering the cycles and systems of the earth.

3. More diverse communities tend to be more stable.

4. Fission and fusion are two relatively new sources of energy.

Concept: Population

Understandings:

A. Lower Elementary (Kdg., 1st & 2nd)

1. A population is a group of plants and animals of the same kind living in the same area.

2. Populations interact with each other and their environment.

3. Populations are part of a given community.

4. The human community is closely interrelated with its environment.

B. Middle Elementary (3rd & 4th)

1. Populations increase, decrease, or stabilize depending on their interaction with each other and their environment.

2. The life style of a human population can affect the environment in significant ways.

C. Upper Elementary (5th & 6th)

1. Human beings both produce and consume materials.

2. Human populations have different standards of living which produce different environmental consequences.

3. As human populations grow, it becomes more difficult to attain and maintain environmental quality.

D. Junior High (7th & 8th)

1. Population changes like births, deaths, growth rates and migration patterns affect individuals, their surroundings and society.

2. The U.S. consumes a disproportionate amount of the earth's resources.

3. Populations have birth rates, death rates, growth rates, densities, immigration rates, emigration rates and age structures.

E. Senior High

1. As long as a few countries consume a disproportionate quantity of the earth's resources, while other countries need these resources, there will be political instability in the world.

2. Different sectors of populations have varying degrees of access to natural resources they need in order to survive.

3. Any position on human population policy has personal, social, ecological, political, and economic implications.

Concept: Economics and Technology

Understandings:

A. Lower Elementary (Kdg., 1st & 2nd)

1. In our country, people are generally trained to perform certain types of work. Teachers, farmers, factory workers, conservationists, as well as other workers, all have special jobs to perform.

2. The food most people eat, clothes they wear and the homes they live in are paid for by the money they earn from doing their jobs.

3. Industries and business sell some things that people want and need: and encourage people to buy some things that factories have made, but people don't really need.

4. Not all people have enough money to buy all the things they need, want, or are encouraged to buy.

B. Middle Elementary (3rd & 4th)

1. The way people live their lives has an effect on how the earth's resources are used.

2. The way people live their lives has a direct effect upon the amount and type of industrial growth that takes place.

3. Businesses can create a demand for a product through the use of advertising.

C. Upper Elementary (5th & 6th)

1. The cost of producing a particular product includes such things as the resources used, wages of workers, advertising, taxes and improving working and environmental standards.

2. There are two kinds of costs associated with pollution: the cost of preventing pollution, and the cost of (or damage from) pollution once it occurs.

3. Some pollution costs cannot be put into dollars and cents.

D. Junior High (7th & 8th)

1. Usually, the costs (economic, resource and technological) of goods and services vary proportionately to societal demands for those goods and services.

2. Patterns and practices of using the earth's resources are largely determined by people's life styles, and the level of industrialization necessary to meet the demands of such life styles.

3. As the production of goods increases with demand, consumption of resources also increases.

4. Both supply and demand of a product influence the cost of the product.

E. Senior High (9th, 10th, 11th & 12th)

1. Economic systems constitute the societal arrangements for producing and distributing the goods and services that individuals and societies desire.

2. Some businesses and industrial plants in the process of producing marketable products pass on social costs (i.e., air, water, and noise pollution) to society.

3. Satisfaction with the philosophy and functioning of the economic system is a major factor in the quality of life for individuals served by that economic system.

4. Each country has its own particular economic system, but all countries' economic systems are tied together through world markets of raw materials, food, and manufactured goods. Thus economic events that occur in one country affect other countries (i.e., crop failures).

5. Three major ecological trade-offs are (1) between population growth and environmental quality, (2) between levels of production and environmental quality, and (3) between the degree of urbanization and environmental quality.

Concept: Environmental Decisions

Understandings:

A. Lower Elementary (Kdg., 1st & 2nd)

1. To make a decision is to make a choice.

2. A decision can be made by one person or by a group of people such as a family or a class.

B. Middle Elementary (3rd & 4th)

1. Environmental decisions should be made only after considering all alternatives and the consequences of each alternative.

2. Your personal feelings and the feelings of others should be considered before you decide to act.

C. Upper Elementary (5th & 6th)

1. Many environmental decisions are made by consumers, governments, businesses, industries, clubs, and various community groups.

2. People working together with similar interests can often be more effective in influencing environmental decisions than individuals working alone.

D. Junior High (7th & 8th)

1. Making effective environmental decisions requires consideration of ecological, economic, political and social and technological aspects of the problem.

2. Effective environmental decision-making includes considering carefully the pros and cons of all possible alternative solutions, policies and actions, and studying the trade-offs among them.

3. Individual or personal decision-making involves one's feelings, attitudes, and values.

4. In many cases it is necessary to change the law in order to prevent environmental abuses.

E. Senior High (9th, 10th, 11th & 12th)

1. Decisions not carefully thought through frequently have unwanted results.

2. People most often affected by environmental abuses may be the least able to bring about effective action to correct them.

3. Environmental decisions should seek to improve the lives of people from all socio-economic classes.

4. Some people and organizations have more power to influence decisions than others.

Concept: Environmental Ethics

Understandings:

A. Lower Elementary (Kdg. 1st & 2nd)

1. Children all over the world have similar basic needs.

2. Every individual has something which he gives and which he receives from society.

B. Middle Elementary (3rd & 4th)

1. If human beings protect the earth it will be able to continue to support a diversity of living things.

2. Humans can be "stewards" of the earth, rather than careless exploiters of it.

3. Humans can develop both a way of thinking and feeling about the earth if we are to live harmoniously with each other and our environment.

C. Upper Elementary (5th & 6th)

1. If humans develop an ecologically sound way of thinking, feeling, and acting toward the earth, then we will be able to live harmoniously with each other and our enviornment.

2. If we protect the earth it will continue to meet the needs of all living things, now and in the future.

D. Junior High (7th & 8th)

1. The earth's resources exist for all living things, not just man.

2. Certain life styles enable man to live as a complimentary part of the environment.

E. Senior High (9th, 19th, 11th & 12th)

1. Only when each of us lives a life guided by respect for the earth and all living things, now and in the future, will we be able to live in harmony with each other and our environment.

2. An essential part of an environmental ethic is a human ethic based on social justice for all individuals and groups.

Middle Elementary

Marilyn Masouredis

Pigeon Population Study

1. Concept to be developed: Ecosystem

2. Understanding to be developed: An ecosystem consists of all the plants and animals in a given area interacting with each other and their non-living environment.

3. Time: Flexible - (Suggest four weeks to compile data)
   day 1 - Present unit
   day 2 - Slides, film, and film strips
   day 3 - Art project
   day 4 - Write fictional stories and read orally
   final - Discussion

4. Materials:
   a. Pictures of pigeons
   b. Drawing paper, paint, crayons
   c. Film, filmstrips, slides
   d. Bulletin board
   e. Reports or fictional stories assembled in a book
   f. Project to raise money for feed (optional)
   g. Data table for bird observation

OBSERVATION TABLE

Number of Pigeons and Other Birds Seen at Our Feeder

	Mon.		Tues.		Wed.		Thurs.		Fri.	
	P*	O*	P	O	P	O	P	O	P	O
Week 1										
Week 2										
Week 3										
Week 4										

	Pigeons				Other Birds			
	Y*	R*	G*	B*	Y*	R*	G*	B*
TOTALS								

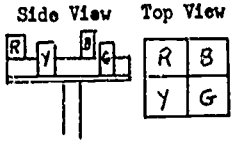
*P = Pigeon
*O = Other

Key 0 - One bird other than a pigeon seen at feeder
1 - One pigeon at feeder
*Yellow - Sunflower seeds
*Red - Bird seed
*Green - Bread
*Black - Food Scraps

h. Bird feeder and feed — sunflower seeds, bird seed, bread, food scraps.

Simple Bird Feeder

Needs 4 sides (1 foot sq. mounted on pipe).
Have different feed in each of 4 sections.
Label sections according to above color code.



5. Procedure:

   a. Choose a location for the bird feeder that is visible from the classroom but not too busy. Set up a schedule for keeping the feeder full of seed. Use a variety of food--sunflower seeds, bread, bird seed, food scraps.

   b. Have a different child keep track of the number of pigeons that come to feed each day on the observation sheet. This gives every child in the class an opportunity to compile data over the month.

   c. Notice the kind of bird and the kind of feed the bird eats.

   d. Ask the children to bring in pictures of pigeons for a bulletin board. Select a committee to work on the bulletin board.

   e. Show films, filmstrips, and slides showing pigeons and their habitat.

   f. As an art project the children can draw and paint large pictures of pigeons in a still position and in flight. A city and pigeon scene can be created on a large wall either in the room or in the hall. Large block and rectangular shaped paper can be cut out and mounted on the wall to represent buildings and the cut out pigeons the children made can be distributed about the buildings by the children.

   g. The children can use a pigeon or pigeons in a fictional story with the bird as the main character. These stories can be read orally to the class and then assembled into a book.

6. Discussion Questions:

   a. Which birds appeared at the city feeder most frequently?

   b. Did the pigeons perch on the school's window sills and roof?

   c. Are the pigeons afraid of people?

   d. Do they eat what appears in the feeder?

   e. Do the other birds eat what appears in the feeder?

   f. Do the pigeons appear singly or in flocks?

   g. Do the same pigeons come back again and again to feed during the day?

Middle Elementary

Nancy Rhodes

Sand Dune Succession

1. Concept to be developed: Ecosystem

2. Understanding to be developed: An ecosystem consists of all the plants and animals in a given area interacting with each other and their non-living environment.

3. Time: 3 days - day 1 - introduction and movie
   day 2 - field trip
   day 3 - discussion

4. Materials:

   a. Sand dune area and access to the area.
   b. Movie (optional) - From Sand Dune to Forest
      Sand Dune Succession Story
   c. Ditto for each student showing diagram of dune succession stages.
   d. Pencil.
   e. White drawing paper.
   f. Ziploc plastic bags.
   g. Thermometer.

5. Procedure:

   a. Introduce dune succession process to children:

      (1). Drift area is important because after decay the material is blown over the sand. This material eventually builds up on sandy areas and provides the right environment for grass to grow.

      (2). More and more grass grows in the area and Cottonwood and Aspen trees find this a suitable environment.

      (3). The Cottonwoods provide a little shade. The environment is now cooler and pines find this a suitable environment.

      (4). Many pines soon take over. Oak trees sprout under the pines. A different environment is created under the pines. The needles from the trees have dropped and created a different type of soil.

      (5). The Oak trees are in competition with the pines for the sun light. The oak trees being broad leaf plants naturally get more sun. They thrive in this environment.

(6). The Oak trees multiply and grow. A canopy of oak leaves block out much sun from the forest floor. With less sun new oak seedlings find the environment less favorable. Maple and Beech trees find the environment suitable. The Maple and Beech thrive and the climax forest takes over.

(7). Fallen branches and trees are important for building up nutrients in the soil.

b. See the movie, "Sand Dune Succession Story - From Sand Dune to Forest".

c. Discuss movie, giving emphasis to the dependency of plants and animals on each other and also on their non-living environment.

d. Field trip to dune area.

e. Pass out ditto to each child. Groups of two or three children would work well together.

f. Take children to drift area first.

(1). Record information (sounds, smells, colors, soil type, plants and animals). Encourage children to really search through the drift area... get down on your hands and knees and REALLY look!

(2). Record the temperature in the drift area.

g. Move on to the middle beach area.

(1). Record information.

(2). Discuss why fewer insects find this environment suitable.

(3). Ask for single word descriptions of the middle beach. (Do this as an entire group).

(4). Record the temperature of the middle beach.

h. Move on to the grass area.

(1). Record information.

(2). Record the temperature of the grass area.

i. Move on to the Cottonwood-Aspen area.

(1). Have the children lay under a tree. Ask what kind of feeling they get in this area (would they get a different feeling in the middle beach area?).

(2). Record information.

(3). Record temperature of the Cottonwood-Aspen tree area.

j. Move on to the pine forest.

(1). Do some quiet sitting. Close your eyes. Listen for sounds.

(2). Have children lay down on their backs. Look up to the sun.

(a). Would it be easier to see the sun in the middle beach area? the drift area? the Cottonwood-Aspen area?

(b). Discuss if this would have any effect on the temperature.

(3). Record the temperature in the pine forest.

(4). Record your information.

k. Move on to the oak forest.

(1). Discuss the colors around the area. What kind of feeling do the colors in this area give you?

(2). Lay on your stomach on the ground. Look around you at this level. Pretend you are a chipmunk looking for acorns and imagine what it would be like to be so small.

(a). If you were a chipmunk, would you like living in this area? Why or why not?

(b). What games would you play if you were a chipmunk?

(c). Where would you build your home if you were a chipmunk? Why or why not?

(3). Record information.

(4). Record temperature in the oak forest.

l. Find a decaying log and explore the fallen log community.

(1). Remove some of the bark and discuss what is found.

(2). Turn the log over. What life lives under the log?

m. Move on to the climax forest.

(1). Identify the kinds of trees.

(2). Pass out white drawing paper. Make natural rubbings. Try to help the children explore many kinds of materials. Berries are good for bright colors. Roots, stems, and leaves all have different color rubs. When pictures are done, display them on sticks stuck into the ground. You can have your own "woods gallery".

(3). Record information.

(4). Record temperature in the climax forest.

(5). Make plastic bag greenhouses. Each child gets a Zip-loc plastic bag. Fill it 1/3 full of forest soil. Take a clipping from a forest plant. Plant it in your bag. Zip the bag closed. Be sure and water your plant when you return to the classroom.

6. Discussion Questions:

a. Which area would you prefer to live in? Why?

b. Which area would you least like to live in? Why?

c. Why do certain animals live in certain areas?

d. What do you think would happen if someone decided to build some homes right in the middle of the climax forest?

e. What do you think happens to the trees and soil that wash into the lake from a blow-out or wash-out?

7. References:

a. Movie: From Sand Dune to Forest - A Sand Dune Succession Story.

Middle Elementary B. Diane Boyd

Tracing Calcium

1. Concept to be developed: Ecosystem

2. Understanding to be developed: The interaction of plants, animals, and their non-living environment form many cycles in an ecosystem (carbon or food cycle, mineral cycles, water cycles, etc.).

3. Time: 1 - 2 hours

4. Materials:

   a. String
   b. Six pieces of cardboard (approximately $8\frac{1}{2}$" x 11")
   c. Colored crayon, felt pen, etc. (optional)

5. Procedure:

   a. Connect string on all 6 pieces of cardboard so they can be worn around the neck.

   b. Write the following words individually, using one piece of cardboard for each word:

      (1). Tooth - (Calcium)
      (2). Soil
      (3). Plant
      (4). Cow
      (5). Milk
      (6). Child

   c. Tell the children that calcium is one kind of mineral. Like water, carbon or food, minerals go through cycles.

   d. Next, give the children a chance to role play. Give one child the neck sign bearing the word TOOTH. Explain that teeth are made of calcium. Being a baby tooth, he has just fallen out on to the SOIL.

   e. TOOTH will now join hands with SOIL, pointing out that there is calcium in the soil.

   f. Next, PLANT emerges from the SOIL. The child bearing the name PLANT joins hands with SOIL. We now realize that plants contain calcium.

   g. Cows eat plants. Indicate this to the class by having COW join hands with PLANT. Therefore, we can conclude that animals have calcium.

h. Cows produce milk. Indicate this by having COW join hands with MILK. Milk has calcium too.

i. Who drinks milk? Children do! Indicate this by having CHILD join hands with MILK. Humans have calcium in their bones.

j. As children grow up, their baby teeth fall out and decompose in the soil. CHILD now loses a tooth. Indicate this by having CHILD join hands with TOOTH to form a circle. This circle represents a cycle.

6. Discussion Questions:

a. Ask volunteers to explain what a cycle is.

b. How did the calcium get from the tooth and back to the child?

c. What other cycles are present in nature?

d. How can cycles be disturbed?

e. Are cycles necessary? Why?

f. Ask students and list where calcium can be found.

7. References:

a. Self Earth Ethic, John W. Hart and Jessie M. Turner. Level Two. The Interstate Printers and Publishers, Inc., Danville, Illinois 61832.

Middle Elementary

Ruth A. Wendrow

Interaction in an Aquatic Environment

1. Concept to be developed: Ecosystem

2. Understanding to be developed: The interaction of plants, animals, and their non-living environment form many cycles in an ecosystem (carbon or food cycles, mineral cycles, etc.).

3. Time: 15 days - day 1 - trip to a pond, collecting materials
   day 2 - set up aquaria
   days 3 - 14 - observe, record, compile data, draw cycles, discussions
   day 15 - dismantle equipment

4. Materials: For each team of four students:

   a. 5 gallon aquarium (or suitable substitute, such as a pickle jar or fish bowl).
   b. Dip net and containers for collected materials.
   c. Pond water or dechlorinated tap water (aged water).
   d. Silica sand or fine gravel.
   e. Rocks about 3 inches in diameter, 3.
   f. Anacharis (Elodea - obtainable at most pet stores, in our pond) or other water plants, at least twelve 10 inch sprigs.
   g. Guppies, 2 mature females and 1 male.
   h. Water snails, 2.
   i. Daphnia (Water fleas), 50.
   j. Minnows, 5.
   k. Pane of window glass (or other suitable cover for aquaria).
   l. Distilled water (optional) or used aged tap water.
   m. Algae culture.
   n. Data or record sheets for each student:

Date	Name of Organisms	Description of Population	Water Condition

Note: The preceding materials list reflects quantities needed for establishing a 5 gallon aquarium. Quantities needed for containers of different volumes should be modified accordingly. For instance, a 1 gallon jar would require only five or six sprigs of Elodea and a 10 gallon aquarium would need about two dozen sprigs.

5. Procedure:

   a. Plan to set up aquarium at least a week in advance of its use.

b. Thoroughly wash out the aquarium. Do not use soap.

c. Spread a layer of sand or fine gravel about 1 inch deep over the bottom of the aquarium. Pile the three rocks in a corner of the aquarium.

d. Fill to within 5 inches of the top with water. If you use tap water, let the water stand in open containers for at least 24 hours before filling the aquarium. This allows chlorine or other gases to escape. Using pond water, allow same time to reach room temperature.

e. Take trip to the pond to collect Elodea, minnows, pond water.

f. Place the cut end of each Elodea sprig down into the gravel layer so that it does not float. Add algae culture to aquarium and more water until it is filled to within 1 inch of the top.

g. Let the aquarium stand in a well-lighted place for two days and then introduce the snails, daphnia, and fish.

h. If possible keep the aquaria near a well-lighted window. If this will subject the aquaria to extremes in temperature, you should place it in a more protected spot in the room. You will then also have to provide a light source of approximately 100 watts about 12 inches from the aquaria.

i. Cover the aquarium with the glass pane to reduce evaporation and to discourage students from adding items to the aquarium. Do not feed the fish or remove any materials from the aquarium in an effort to keep it clean! Add distilled or aged water periodically to maintain the water level. (Distilled water is recommended to prevent buildup of mineral concentration over prolonged period; however, local tap water, if low in mineral content may be used satisfactorily, or pond water, whose mineral content has been checked.)

j. Have students compile a list of the kinds of organisms in the aquarium. If they do not suggest it, remind them that some organisms are microscopic. Allow students to examine water samples under the microscope. As time passes, different organisms may "appear" (fungi, etc.) and should be added to the list. From class list use charts on ditto sheet to compile data on the date set up and every day of the project thereafter. The dates and descriptions of any changes that occur in the aquarium should be recorded.

k. Explain that nothing but water is to be added to the aquarium. Have students compile individual lists of all the interactions they think each kind of aquarium organism may be involved in. If the lists omit any organism it (and its interactions) should be added later. A composite list of organisms and interactions should be constructed and saved for later modification.

l. Ask students to predict the future of life in the aquarium. Mention that they can check the accuracy of their predictions by regular observation.

m. Make room charts, with the students, of the carbon cycle, food chain, and water cycle.

6. Discussion Questions:

a. How do algae and elodea fit into the CO_2 cycle?

b. What do plants need for photosynthesis?

c. What are the end products?

d. Why are these materials (end products) important?

e. What else is needed in this cycle? What can't this cycle do without?

f. Describe evaporation from the water surface. From plants.

g. How is condensation apparent in the aquarium?

h. What part does the animal life play in the water cycle?

i. When water evaporates, it becomes a _____?_____. When it freezes it becomes a _____?_____.

j. If you heard one life scientist talking about the carbon cycle and another life scientist talking about the oxygen cycle, could these two scientists possibly be talking about the same thing? (Let students think about this, discuss it among themselves, review what they know.)

k. Is energy ever recycled in these natural processes?

l. Discuss: Since water is recycled, the amount of water on earth does not change.

m. Why did we have to add water to our aquarium?

n. Describe the ecological succession that would occur if we added nothing.

o. Water is vital to all organisms to dissolve the chemicals they need. Why must these chemicals be dissolved?

p. Chemicals in the soil become part of the plants. What happens to these chemicals when plants die?

q. Would man fit into the carbon cycle? The water cycle? Explain.

Middle Elementary

Maryanna Baldwin

Water Heating Demonstration

1. Concept to be developed: Ecosystem.

2. Understanding to be developed: Some of the sun's energy has been stored in coal, peat, petroleum, natural gas, and other fossil fuels.

3. Time: 3 days - day 1 - set up demonstration, draw chart.
   day 2 - begin heating water, record temperatures.
   day 3 - discussion, show film.

4. Materials:
   - 7 beakers to hold water
   - 7 thermometers
   - 1 hot plate
   - hibachi and charcoal
   - kerosene or alcohol lamp
   - 1 large table or shelf space
   - window with access to sunlight
   - propane (or cigarette lighter)
   - butane gas
   - bunsen burner
   - asbestos sheets
   - chart for recording temperatures.

	#1	#2	#3	#4	#5	#6	#7
9:00							
10:00							
1:00							
12:00							
1:00							

Film---"Fuels: Their Nature and Use."

5. Procedure:

   a. Set up materials for demonstration in the classroom, including the following:

      7 beakers filled with water with a thermometer in each one:

      #1--set in a spot in the classroom which has access to sunlight.
      #2--set in a spot which has no sunlight, such as a closet.
      #3--Electric hot plate.
      #4--hibachi, with charcoal.
      #5--kerosene lamp.
      #6--propane.
      #7--bunsen burner.

   b. Make chart to record temperatures.

   c. Choose a committee from the class whose responsibility will be to keep track of temperatures in each beaker, and record on chart hourly.

d. Show film: FUELS: THEIR NATURE AND USE. Show this after or during discussion questions.

6. Discussion Questions:

a. How long did it take for the water to be heated in each of the beakers?

b. What does the chart of recorded temperatures tell us about uses of energy?

c. What is the origin of the fuels which were used to heat the water?

d. Think about why these materials might be referred to as "fossil fuels."

e. Can you draw a conclusion about what our main source of energy is?

Middle Elementary

Montel Ruble
Marion Maitland

The Sun's Stored Energy

1. Concept to be developed: Ecosystem
2. Understanding to be developed: Some of the sun's energy has been stored in coal, peat, petroleum, natural gas, and other fossil fuels.
3. Time: One day
4. Materials:
    a. Geological time line chart
5. Procedure:
    a. Display time line chart.
    b. Introduce time line so students will understand geological processes of the earth.
    c. Organize children into 4 groups for creative dramatics.
        (1). One group will represent plants and animals of the Pennsylvanian period of the Paleozoic Era.
        (2). One group will represent the different environmental conditions of the Pennsylvanian period.
        (3). One group will represent the Cenozoic Era.
        (4). One group will represent the fossil fuels of the present time.
        (5). One person will be the sun.
    d. Give the students an opportunity to meet in their specific groups to work up their part in the creative dramatics skit.
    e. Each group will act out their part of the skit.
6. Discussion Questions:
    a. Discuss the different environmental conditions of the earth which took place during the Pennsylvanian period.
        (1). What made the plants and animals change?
        (2). Bring out the changes made by ice, water, eruptions and upheavals of the earth's crust.

b. Has the sun ever changed during all these years?

c. Where has the sun's energy been stored?

d. Why is the sun so important to life?

e. Name the fossil fuels.

f. How does man use the fossil fuels?

g. Will man ever run out of fossil fuels? Why?

7. References:

a. Geology and Man. Kenneth and Hussey Russell, Prentice-Hall Inc., New York. 1948.

Middle Elementary

Beverly A. Kavasch
Darlene A. Leland

STUDY OF A FRUIT FLY ECOSYSTEM

1. Concept to be developed: Population

2. Understanding to be developed. Populations increase, decrease, or stabilize depending on their interaction with each other and their environment.

3. Time: 1-2 weeks.

4. Materials needed: 3 small jars.
   1 pair "run" nylon panty hose
   3 large strong rubber bands
   3 1-yard pieces of dark colored cotton material
   Supply of fruit and other food
   3 vials of purchased fruit flies
   Wall chart for recording daily observations

5. Procedure:

   a. Order three vials of fruit flies.
   b. Upon receipt of flies, place a piece of an apple and empty one vial of fruit flies in each jar.
   c. Secure a piece of nylon material over top of each jar as soon as flies are placed in jar.
   d. Label jars with "A", "B", and "C".
   e. Discuss with group what observations they can make about three groups.
      1. Request likenesses
      2. Request differences
   f. Put up wall chart with "Date", "A", "B", and "C" columns.
      1. Record first day's observations.
   g. Explain that the Groups "A", "B", and "C" are going to have different environmental conditions established for them from that date forward. Children should be reminded that accurate daily observations are important.
   h. Establish diets for three groups.
      1. Group "A" will be given small piece of bread, a piece of chocolate, and a piece of potato chip each day.
      2. Group "B" will be provided no additional food beyond original piece of apple.
      3. Group "C" will be provided a small piece of overripe fruit or vegetable matter each day.
   i. Cover jars with black cotton before leaving school and uncover in the morning just before food is added.
   j. Record daily changes which children observe in the fly groups.
      1. Comparisons should be encouraged.
   k. Results of different environmental conditions should become obvious in a very few days.
   l. The control experiment should be summarized with an evaluation period and discussion.

6. Discussion Questions:

   a. Did the population of fruit flies increase? In which jar?
   b. Did the population of fruit flies keep on getting bigger? Why?
   c. Did the population of fruit flies decrease? When? By how much?
   d. How do you explain this change in population size?

7. References:

a. Books and Pamphlets
1) Minnesota Environmental Sciences Foundation, Inc., Change in a Small Ecosystem, National Wildlife Federation, 1972.

2) Pettit, Ted S., A Guide to Nature Projects, W.W. Norton & Company, 1966.

3) Shugrue, Sylvia K. & Lamberton, Bernice, Environmental Education in the Elementary School, National Science Teachers Association, Washington, D.C., 1972.

4) Shuttlesworth, Dorothy Edwards, Exploring Nature with Your Child, Greystone Press, 1952.

b. Scientific Suppliers:
1) Carolina Biological Supply, Burlington, North Carolina
2) Cinco Scientific Supply, W. Seven Mile Road, Detroit, MI

Middle Elementary Kathy Page

Goldfish Population Study

1. Concept to be developed: Population

2. Understanding to be developed: Populations increase, decrease, or stabilize depending on their interaction with each other and their environment.

3. Time: a month or more

4. Materials: 2 aquaria (a quart jar and a 10 gallon tank)
   8 goldfish (medium sized)
   fish food, plants, gravel

5. Procedure:

   a. Set up the 2 aquaria exactly alike with 4 fish in each one.
      1. Wash the two aquaria throughly with plain tap water.
      2. Put the gravel in the bottom of the tanks and put newspaper on top of the gravel.
      3. Pour tap water onto the newspaper slowly which prevents the gravel from being stirred up, until the tank is 3/4 filled.
      4. Take out the newspaper and arrange your plants.
      5. Put the newspaper on the surface of the water and gently fill the aquarium and let it stand for 2 days to evaporate the chlorine.
      6. Put the fish in 2 plastic bags, floating them on top of the water in the aquariums for ½ hour. Then release the fish.

   b. Make daily observations of the two aquariums ie. the number of fish present, aggressiveness, water conditions, etc.

   c. Afterwards you may wish to expand to other variables using aquaria of the same size, ie. plant life, food, snails.

6. Discussion Questions:

   a. What is different about the 2 aquaria?

b. Are the fish in the large aquarium more aggressive? Why?

c. Are there more fish in the small aquarium after a month? Why?

d. How has the water conditions in the aquariums changed?

e. Has the condition of plants changed in the aquariums?

f. Draw the food chain sequence in the aquariums?

g. What happens when the plants are removed? Why?

7. References:

a. Sale, Larry L. & Lee, Ernest W. Environmental Education in the Elementary School. Holt, Rinehart & Winstron, Inc. 1972.

SCHOOL TRAFFIC CONGESTION -- POPULATION STUDY

1. Concept to be developed: Population

2. Understanding to be developed: The life style of a human population can affect the environment in significant ways.

3. Time: 5 days - day 1 - take pictures of school entrances immediately before and after school beings.

day 2 - conduct a survey of how children get to school.

day 3 - construct a chart of the survey. Plot a curve to show how many get to school each way. Figure percentages.

day 4 - discussion of life-style and habit (how they affect us daily.) Use examples to prove points.

day 5 - decide what the problem is, and what possible solutions might be feasible. Simulation of all activities so far.

4. Materials: Camera (Instamatic) and film. Chart made up to show method by which each child gets to school. (Sample chart enclosed). Paper, crayons, other art materials for drawings of traffic scene. Resource person - policeman.

5. Procedure:

a. Have children prepare cameras to take pictures of school driveway at peak time to capture traffic congestion. Prepare pictures to be set up in a display for school showcase.

b. Have children prepare chart, by taking survey of how each gets to school.

c. Students will connect points on graph to show various ways of getting to school and the percentages demonstrating how many use each method of transportation.

d. Students will begin a discussion on life-style and habit, especially how these terms affect them and why.

e. Groups will be formed in which plans for debates on traffic congestion at school will be discussed.

f. A resource person, a policeman, will discuss the situation as he sees it -- community and environment-wise.

g. Students will discuss the talk by policeman -- what was said, if children agreed, how it applied to them.

h. Simulation of all discussions and activities.

6. Discussion questions:

   a. If given a choice, which way would you choose to go to school? Why?

   b. What does the chart show? Explain what results you get from connecting the points on the chart, and in determining percentages.

   c. What are the implications of the results of the graph?

   d. What would happen if all the children had their choices, concerning transportation to school? Why?

   e. What could happen if a population, all with similar life-styles, each took their children to school in the same way and at the same time?

   f. How would you solve this problem? Are there any other possible solutions?

   g. What might you personally do to help? What might others do?

   h. How would you begin in solving this problem? Who might you ask to help? Why?

   i. Design a plan by which the school might be more free of this traffic problem. Add a picture of what your school would look like then.

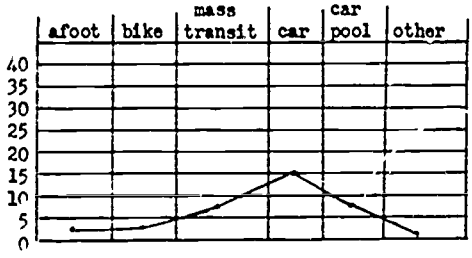
7. Additional suggested activities:

   a. Discuss congested traffic patterns at school. Children should divide into panels and plan debates on how to solve problems created by this congestion. These might be organized to present in the form of a program to parents or other people who are concerned with the problem.

   b. Make a film demonstrating the traffic problems at school, and how they might be solved.

   c. Design a type of news-letter to go home to parents, explaining the results of charts, pictures, comments by resource people, and any other pertinent information. This would be for the purpose of alerting parents to the family problem.

8. Chart: How Children Are Transported to School Each Day



$$\text{Percentages} = \frac{\#\text{ students traveling a particular way}}{\text{total \# students in class}}$$

Afoot = %
Bicycle = %
Mass transit = %
Car = %
Carpool = %

Life Style

1. Concept to be developed: Population.

2. Understanding to be developed. The life style of a human population can affect the environment in significant ways.

3. Time: 2 days.

4. Materials:

   a. Film: the "Ark", 20 minute, color, 1970.
   b. Art paper and supplies.
   c. Film: "Buttercup", 15 minute, color, 1971.
   d. Cameras.
   e. Chart paper and markers.

5. Procedure:

   a. Introduce and explain the term "life style".

   b. Discuss with students the different influences certain cultures life-styles have had on nature e.g., Indians - conservationist, White Society - urban slums., etc.

   c. Show the film the "Ark". Discuss with class that the film deals with how man's life style can and has influenced the environment. After viewing the film ask students to tell you what were the effects on the environment by man's life style.

   d. Take students out around the neighborhood and ask them to observe the life style of the community, e.g., big cars, little cars, no cars, neat front yards, junky front yards, friendly neighborhoods, unfriendly neighborhoods, etc.

   e. Have students take some slides of the community, have them discus the possible affects on the neighborhoods environmental quality due to different life styles.

   f. Discuss in class how people might change their life styles to be more responsible to the total environment.

   g. Show film "Buttercup" - have students pick out the different life styles present in the film, also pick out the type of environmental pollution shown.

h. Discuss how man has caused our world to be in the shape it is. Ask students to tell you how they would run the world, in order to make it a better place to live. This can be done either through a verbal expression or through a visual expression - art work.

6. Discussion questions:

a. What is a life style?
b. What does environment mean?
c. What is a neighborhood?
d. What is a flower?
e. What does the word quality mean?
f. What does the word responsibility mean?
g. What does the word community mean?
h. What does the word population mean?
i. What does urban mean?
j. What does rural mean?
k. What does pollution mean?
l. What does conservation mean?

Reference:

The "Ark" 20 minute color, 1970. The University of Michigan Audio-visual Center, Ann Arbor, Michigan.

Buttercup. 15 minute, color, 1971. The University of Michigan Audio-visual Center, Ann Arbor, Michigan.

Energy Use Study

1. Concept to be developed: Economics and Technology.

2. Understanding to be developed: The way people live their lives has an effect on how the earth's resources are used.

3. Time: 5 days - day 1 - Bake cake
   day 2-3 - Take home survey worksheets
   day 4 - Share results of survey
   day 5 - Discussion questions

4. Materials:

   Boxed Cake mix (any kind)
   Wooden mixing spoon
   Portable electric mixer
   Bowl
   Cake pan
   Access to oven in school
   Worksheet: (1 copy per student)

The Helpers We Have Today

Directions: Look at the list below. Put a check mark by the ones which you have in your home now. Ask your parents if they used this appliance when they were your age (approx. yr. 1945). Then ask your grandparents (or someone about their age), if they had this appliance in their home (approx. yr. 1915).

Appliance	1915	1945	Now
1. Refrigerator			
2. Central heating			
3. TV set			
4. Power mower			
5. Vacuum cleaner			
6. Clothes dryer			
7. Automatic washer			
8. Hot water tank			
9. Electric hair dryer			
10. Freezer			
11. Electric or gas range			
12. Electric fan			
13. Air conditioner			
14. Toaster			
15. Electric frying pan			
16. Car air conditioner			
17. Electric dishwasher			
18. Blender			
19. Electric toothbrush			

Appliance	1915	1945	Now
20. Garbage disposal			
21. Electric blanket			
22. Phonograph			
23. Electric razor			
24. Electric trimmers			
25. Electric garage door opener			
26. Radio			
27. Electric mixer			
28. Electric knife			

5. Procedure:

   a. To introduce the concept of energy, prepare with the class, a boxed cake mix, applying both hand mixing and electric beating techniques.

   b. Discuss how energy was involved in mixing the cake.

   c. Bake the cake.

   d. Discuss sources of energy (ex.: human, wood, gas, oil, falling water, electricity).

   e. Distribute worksheet (see Materials), and have students take home to make survey. Note: For 1915 column, encourage students to talk to the oldest person they know, if their own grandparents are not available.

   f. Return work sheet to class - compile data on board, with number of checks for each appliance, under each period of time.

6. Discussion questions:

   a. During which period of time did you make the greatest number of check marks?

   b. Were you able to find out anything about what life was like for your grandparents (or oldest person you contacted), in regard to: how they traveled; to what extent gas or electric appliances were used; how food was cooked; how the washing was done; how the home was heated?

   c. What do the answers to the above question tell you about how much energy we are using today?

   d. Are there any electrical appliances on this list which you feel your family could do without?

   e. What are some of the ways in which you could help in conserving energy?

   f. Are there some ways in which we could save energy use in our school?

7. References:

   a. Folker, The Energy Crisis (What you can do about it), Standard Oil Co. (Indiana), 1973.

Housing and Resource-Consumption Study

1. Concept to be developed: Economics and Technology.

2. Understanding to be developed: The way people live their lives has an effect on how the earth's resources are used.

3. Time: 2 days - day 1 - compile research
   day 2 - comparison of research, discussion.

4. Materials:

   a. Access to a building under construction, if possible.
   b. Yellow Pages of telephone directory.
   c. Donated time from a construction engineer to speak before the class on day 2. (optional)

5. Procedure

   a. Assign two or three class members the task of visiting a nearby building or house currently under construction, for the purpose of gathering small samples of modern construction materials (wood, concrete, strip of wire, etc.). Permission of parents and contractor will have to be obtained.

   b. Divide the rest of the class in half. One half will do elementary research on the construction of 19th century Plains Indian teepees, with special attention to materials used, sources of materials, and how materials were obtained.

   c. The remaining half will make a "construction materials home work survey" of their own homes, listing as many kinds of raw materials as they can find. While doing this, they should make guesses as to the sources of those materials. (where did the lumber, plumbing metals, floor-tile materials etc. come from?) They should have these lists with them when they return to school on the following day.

   d. If possible, contact by telephone a construction contractor, and ask whether or not an engineer might be willing to speak to the class about the geographic sources of raw materials for modern construction, how they are processed for use, and how they are transported to the building site. The engineer can also explain how a building site is prepared, and how actual construction proceeds.

e. Assume that a modern building is being constructed in your town, With the help of the engineer, locate the sources of raw building materials on a map of the world, and connect those locations to your town with string.

f. Now, assume that a 19th century Plains Indian is building a teepee in southern North Dakota of 100 years ago. Do the same raw-material source-location with respect to the Indian's environment and his construction needs.

g. Have the children make a table to compare the two kinds of housing on the basis of kinds of materials used, place obtained from (in the raw state), means of obtaining the raw materials, relative amount of human and non-human energy, expended in obtaining them, relative amounts of living versus non-living raw materials used.

6. Discussion Questions:

a. Which type of house would be more difficult to build? Why?

b. What happened to the natural resources which the Plains Indians used to build their houses?

c. Which type of house takes the most work to build? Work by humans? Work by machines?

d. What will happen to modern construction if the raw materials cannot be transported easily to the building site?

e. What would happen to a modern builder if he could no longer obtain an important material, such as copper (wiring, plumbing, etc.)?

Middle Elementary

Marion Maitland
Montel Ruble

Interrelationships of Waste and Demand

1. Concept to be developed: Economics and Technology

2. Understanding to be developed: The way people live their lives has a direct effect upon the amount and type of industrial growth that takes place.

3. Time: One week - day 1 - field trip and classification project
   day 2 - collect throw-aways in classroom
   day 3 - collect throw-aways from home
   day 4 - compile data, tally on chart
   day 5 - discussion

4. Materials: 6 paper bags for group work, 1 paper grocery bag for each student, data table for each student.

Papers	Plastics	Aluminum

5. Procedure: a. Take a walk around the school yard and collect throw-aways put them in a bag to be taken back to the classroom.

   b. The students are divided into 6 groups when they get back to the classroom. In their small groups they will decide together to:
   1). Divide the throw-aways into two piles.
   2) Classify the throw-aways into two groups as to their usefullness and unusefullness.

   c. The students will collect all their classroom throw-aways for three days and put them into a large grocery bag.

   d. The students will collect as many throw-aways that they can from home and put them in their bag.

   e. Ditto the master sheet so each student can have a copy.

   f. Students will tally on their chart the number and kinds of throw-aways they have collected during the weeks time.

   g. Provide a space on the chalkboard or large chart in front of the room to tally the total classrooms findings.

6. Discussion Questions:

   a. What kinds of things have been used and thrown away?

   b. What kinds of things have been used most and thrown away by the whole class? Look on large room chart.
      1) Discuss data from room chart.

   c. How could their families use less throw-aways?

   d. How could their families use less throw-aways?

   e. What might happen if less of these materials were used?

   f. Discuss what is in their family life styles as to why they used more of one kind than another.

   g. From the information provided, can they make an inferences concerning the amounts they use and what it might determine as to an increase or decrease in production of such products?

   h. Bring out the fact that decrease production could cause unemployment for people.

7. References:

   a. Habits and Habitats, My Weekly Reader, Book B. Education Center, Columbus, Ohio.

Family Electrical Usage Study

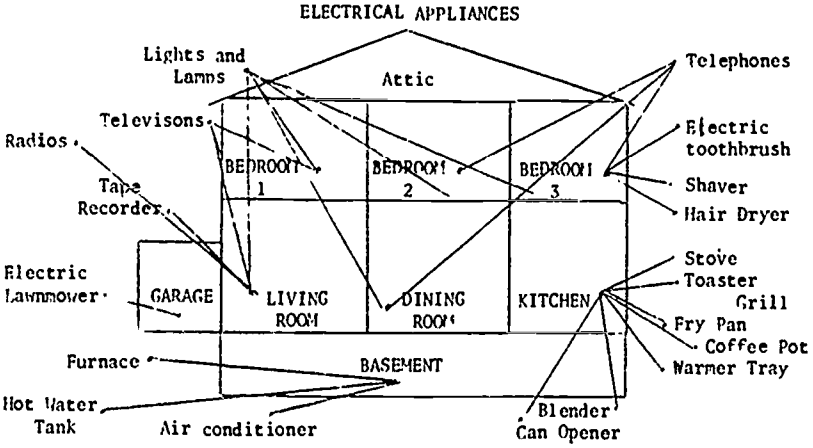
1. Concept to be developed: Economics and Technology.

2. Understanding to be developed: The way people live their lives has a direct effect upon the amount and type of industrial growth that takes place.

3. Time: 7 days - day 1 - Introduce unit
   day 2 - field trip
   day 3 - visitation
   day 4 - films and filmstrips
   day 5 - assemble bulletin board
   day 6 - compile data
   day 7 - discussion

4. Materials: Access to a local electric company.
   Promotional unit by the local telephone company.
   Films and filmstrips depicting a non-industrial society
   Bulletin board depicting the cross section of a house and the appliances within:

Bulletin Board (Suggestion)*



*Use ribbon or string for connectors.
Use words and/or pictures for electrical items.
Use construction paper for the house.
Use electrical cords for the title of the bulletin board. The letters can be pinned into shape.

4. Materials (Continued)

Individual data sheets for electrical item inventory:

Electrical Items in My Home

Clocks	Fans	Lights and Lamps	Radios	Television	Tape Recorders
Electric Toothbrush	Electric Knife	Electric Shaver	Electric Hair Dryer	Stove	Toaster
Grill	Waffle Iron	Fry Pan	Coffee Pot	Warmer Trays	Bun Warmer
Blender	Mixer	Furnace	Hot Water Tank	Air Condi-tioner	Electric Lawnmower
Electric Edger	Electric Trimmer	Telephone	Can Opener	Power Equipment	Other

Key: 1 = one for each item of that type in the home

Total number of electrical items in my home:_____

5. Procedure:

a. Introduce the unit by pointing out the items in the room and school that require electricity.

b. Take a field trip to the local electric company. Have the children keep track of the number of factories and warehouses along the way.

c. The Michigan Bell Telephone Company has an excellent promotional package that includes films, film strips, telephones, and visitation by a telephone person with his truck and gear.

d. Show films depicting non-industrial people like the aborigines of Australia or the Eskimos of Alaska.

e. Have the entire class build the bulletin board. Only the cross section of the house and garage with the rooms labled, should be done ahead of time. As the children name the possible electrical items found in a home, pre-cut paper strips can be labled with felt pen and pinned to the board along with the connecting strings showing the number of appliances of that type and their possible location in the house.

f. Have each youngster take home and fill out an Electrical Items data sheet. Anything that requires electricity is to be shown on the sheet.

g. To correlate this unit with math, each child in a row can submit his total number of electrical items. This would give us about six reasonable renaming problems in addition. Then the total of each row will make up the final and more difficult addition problem. The answer will be the total number of electrical appliances used in the homes of the whole class. This lesson can be done at the chalk board.

6. Discussion Questions:

a. Compared to the people we saw in the film, do we use a lot of electricity? How do you know we use a lot of electricity?

b. How do our surroundings differ from the surroundings shown in the film? How do we differ from the people in the film?

c. How do our homes, clothing, food, communication, transportation etc., compare with what we saw in the film?

d. Could we live the way we do without electricity?

e. What would our lives be like without electricity?

f. What would our surroundings be like without electricity?

Middle Elementary Richard H. Willhite

Advertising and Product Demand

1. Concept to be developed: Economics and Technology.

2. Understanding to be developed: Businesses can create a demand for a product through the use of advertising.

3. Time: 60 minutes.

4. Materials:

   a. Old newspapers and magazines (women's, men's, hobby, travel, fashion, news, etc.).

   b. Several large sheets of poster paper.

   c. Paste.

   d. Scissors for each child.

5. Procedure:

   a. Have the students look through the magazines to find advertisements for products that they would like to own, now or as adults.

   b. The students should cut the ads out and make collages by pasting them on the poster paper.

   c. Have them make a list of ten products they would like to own whether shown in one of the ads or not.

6. Discussion questions:

   a. Ask students to explain the reasons for choosing certain advertisements. What was it about the advertisement that suggested that the product would be good to own?

   b. Look at an advertisement someone else chose. What do you think it is about the ad that made the other person choose it?

   c. Find an advertisement for cigarettes. What else is shown in the ad besides the product itself?

   d. What are some extra things shown in the other ads?

   e. Why do advertising men show those other things if all you can really buy is the product itself?

f. Do any of the ads show the product as it is being made? Why or why not?

g. Do any of the ads tell you about problems associated with the product (auto wrecks, injuries to the user, high energy consumption, etc.)? Why or why not?

h. Does any ad show the product when it is old and worn out? Why or why not?

i. The writing on pencils, lightbulbs and some manhole covers is advertising, too. Do these ads make you want to rush out and buy a pencil or a manhole cover?

j. How are those ads different from those in the magazines?

k. Which of those items on your lists did you first hear about from someone you know?

l. Which ones did you read about? Mark these with a book shape.

m. Which did you see advertised on television? Mark these with a box shape.

n. Which ones did you first hear about on the radio? Mark these with a rectangle.

o. Does advertising play a large or a small role in helping you decide what to buy?

p. Who pays for advertisements?

Middle Elementary. Karen Kline

Advertising

1. Concept to be developed: Economics and Technology

2. Understanding to be developed: Businesses can create a demand for a product through the use of advertising.

3. Time: 1-2 weeks

4. Materials:

   a. Any available art materials to be used for purposes of advertising (paints, crayons, scissors, rulers, construction paper, glue, poster board, etc.)
   b. Dittos and ditto paper for handbills
   c. Stage and costumes for TV ads
   d. The needs for materials are flexible and depends on the materials available to you in your situation.

5. Procedure:

   a. Divide your class into two groups who will work as competitive teams.

   b. The two groups should each be given a box (plain and unadorned and exact same sizes). The class should then agree to its fictional contents. Ex.- cookies, crackers, popcorn, cereal, etc.

   c. Each group can advertise their product to the school in any form:

      (1). Designing a package cover and displaying (include name of product and picture).
      (2). Putting up posters in the school.
      (3). Mock TV advertisements to be presented before school.
      (4). Newspaper ads for school newspaper.
      (5). Salesmanship pitches which may be presented to different classes.
      (6). Mock radio advertisements which could be presented over an intercom system.
      (7). Handbills written up on dittos.
      (8). Set up contests using proposed labels as requirements to enter the contest.

   d. Advertise for one to two weeks depending on your program.

   e. Send a secret ballot vote around the school and have each child vote on which product he would buy as a result of advertising.

   f. Tabulate the results of the vote.

   g. Conduct a debriefing session after the results are known.

6. Discussion Questions:

a. Perform a class secret ballot vote to see if results conform to the school decision.

b. Which form of advertising did each opposing group excel or do best in? Why was it better? (color schemes? design? descriptive words? appeal to the age groups? etc.)

c. Were there any familiar products which you copied ideas from?

d. Did success depend on time expenditure?

e. Did success depend on material expenditure (cost)?

f. Can you think of a product you were interested in by advertising but when you tried it, you didn't like it?

g. Can you give any suggestions of some helpful critism to your fellow team on their advertising?

h. Do you feel the school vote results would have been the same if there had been no advertising and only two products were given as follows:

Product A
Product B

i. Do you think you would like advertising as a career?

Middle Elementary

Maryanna Baldwin
Marilyn Masouredis

Land and How the People Want to Use It

1. Concept to be developed: Environmental Decisions.

2. Understanding to be developed: Environmental decisions should be made only after considering all alternatives and the consequences of each alternative.

3. Time: 4 days - day 1 - Select committees and discuss needs
   day 2-3 - Presentations
   day 4 - Boards decisions and why

4. Materials:

   Pencils and paper
   Newsprint, felt pens, and rulers
   Specific areas for group discussions and work

5. Procedure:

   a. Present the class with the problem of a specific tract of land and its possible development by the community. This land encompasses a virgin forest, small lake, meandering river, and evidence of wild life.

   b. Have the children volunteer for one of the following interest groups:

industry	recreational
commercial	environmental
shopping mall	residential

   c. Explain that this is a make-believe situation. Our tract of land cannot accommodate development by all the interest groups, just one. A board of four will be elected by the class to decide on the issues and arguments presented by the interest groups. The teacher can sit and vote on this board also.

   d. Have the class elect the board of four. The board can in turn select a chairman. Each board member should be responsible for his own note taking. After the board has been elected give the students on the board a choice of occupation. List some examples: doctor, judge, teacher, retiree, accountant, journalist, salesman, dentist, business man, etc.
   After making an occupational choice instruct the students to think in that way.

e. Each interest group should go to their work areas to discuss reasons for including their particular area of interest They should choose a spokesman and secretary to list their arguments. Allow about fifteen minutes for this.

f. The spokesman for each interest group should present their facts to the board.

g. When each group has finished presenting their facts the board should spend about fifteen minutes deliberating the facts. Each member of the board can vote for only one of the interest groups.

6. Discussion Questions:

a. What opinions do you have on the presentations of the other groups? Do you think that they had good reasons for wanting their interests included?

b. Following the board's decision, what will some of the consequences be in regard to:

1. How many people will benefit from the use of the land?
2. What natural resources will need to be used in order to develop the land?
3. How may the use of the land effect the population of the community?
4. Will the use of the land create new jobs for people?
5. In what ways will the development of the land effect the wildlife in the area?
6. Can you picture what this plot of land will be like five years from now?

Middle Elementary — Glen Erickson

Environmental Community Planning

1. Concept to be developed: Environmental Decisions

2. Understanding to be developed: Environmental decisions should be made only after considering all alternatives and the consequences of each alternative.

3. Time: 1 week.

4. Materials: Introductory remarks: If you have access to the Coca-Cola game, "Build Your Own World", play that first with your class. It is a good game to start the students thinking about decisions and their consequences. Then have the class build their own community on large paper, or even a model. If you can't play the Coca-Cola game, you still can do this activity, but it helps if they have the opportunity to play "Build Your Own World".

   a. Large paper (rolled paper is fine)
   b. Pencils, colored pencils, crayons, or paint
   c. Blackboard

5. Procedure:

   a. Explain to the class that they are going to plan a community of their own.

   b. All the decisions involved in planning the community will be made by the class.

   c. Have the class suggest different groups of people that will be in their community, such as:

      (1). Farmers
      (2). Businessmen
      (3). Labor - construction workers, factory workers, etc.
      (4). City Council
      (5). School children
      (6). Senior citizens
      (7). Large industry
      (8). People interested in preserving and protecting wildlife
      (9). City Departments: Sewage Treatment, Parks and Recreation, etc.

   d. Have the class divide into interest groups based upon their suggestions.

   e. Have each group decide on things that they feel are important to have in their community. For example:

(1). Labor — We want factories to work in, an expressway to build, providing many jobs for the community. We don't care too much about how our constructions and factories hurt the environment because we need jobs to live.

(2). School children — We want parks to play in, streams and lakes to swim in, and wildlife to see.

f. After each group has decided on the things that they most want to see in their community, have the class together decide upon specific items they want to consider putting in their community. This part of the activity should be used to bring out any and all items the class can think of that could be included in their community. Deciding upon what things the class actually wants, and their locations will be done later in the activity.

g. Now have the class decide which items they feel are the most important (from their suggestions in part f) to decide upon. For example: the class might suggest having a zoo, and an amusement park, but decide that of those two items only the zoo will be seriously considered and voted upon.

h. After the class has decided upon the most important items (new items can be considered later on, if forgotten or first thought to be unimportant), list these items on the board and begin to decide by voting, whether the item should be included in their community, or not. Each interest group should represent their particular interest in the discussions. If a student feels that something wasn't brought up by the group interested in that area, he should voice his own concern after all the other groups have been heard.

i. By voting, the class now decides whether or not to include each specific item. The class should decide before voting how the procedure for voting should take place, such as: a simple majority of the class decides the vote, or two-thirds of the class must approve of an item before it will become part of their community.

j. Once the voting is completed on what items will be put in their community, the location of each item must be decided upon.

k. Take each item separately and after each interest group speaks out concerning where the item should be placed, another vote should be conducted, finally arriving at a final location for an item.

l. When the location has been decided for a particular item, place the item on your large picture or model of the community. This map can be drawn on the board, on large paper, or as a model. It should include many of the areas that your community has. For instance: rivers, lakes, woods, downtown business district,

farmland, residential areas. Leave out the specific items that will be voted upon, only including them if they are approved by the class.

m. Continue this procedure for the remaining items to be voted upon until you have finished planning your community.

6. Discussion Questions:

a. Did your class decide to place all the suggested items in your plan?

b. What items conflicted with each other, such as: expressway construction and open space (parks, fields, woods, streams, etc)?

c. Did you find that many items were voted upon in favor of one or two groups?

d. What were the most important reasons for the voting outcomes? Did most of the decisions revolve around certain reasons, like: increasing industrial growth progress, making more jobs, the need for open areas, convenience, recreation?

e. What conflicts of interest groups occurred in the voting sessions?

f. What similarities does your plan have with your own community?

g. Did your class decide the same way your community has, about which items to include and their locations?

h. Did you feel that your class planned your model in a better way than your community has? What factors (environmental concerns, social concerns, considering everybody's feelings and needs, etc.) did your class consider more thoroughly than it appears your own community has?

i. Is it possible to reach agreements or compromises that seem to benefit everyone in some way? If so, how did your class reach your agreements?

j. Did every group and every individual student have an equal voice in making the planning decisions?

k. Were long-range consequences of placing certain items in your planned community considered, especially in light of other alternatives?

Middle Elementary

Glen Erickson

How Do You Feel?

1. Concept to be developed: Environmental Decisions

2. Understanding to be developed: Your personal feelings and the feelings of others should be considered before you decide to act.

3. Time: 1 - 2 hours

4. Materials: Introductory remarks: People's feelings play a large part in their decisions and in decisions that directly affect them. When decisions are made without considering everyone's feelings, the results often benefit only a few people. This activity is designed to help the students identify their own feelings, recognize other people's feelings, and involve both these sets of feelings in making more just decisions.

   a. Blackboard or ditto
   b. Pens and paper

5. Procedure:

   a. Either write on the blackboard or on a ditto a series of questions such as:

      (1). Would you like to go to an amusement park and ride on a ferris wheel?

      (2). Would you like to walk around one day blindfolded?

      (3). Suppose your class all goes to a store, and half of the class is given 25 cents to spend, and the other half is given 5 cents apiece to spend. You are one of the students who is given 25 cents to spend. What would you do with your 25 cents?

   b. Now have the students respond to the questions by writing their answers on a piece of paper or on a ditto. Follow this by sharing out different student's decisions and their reasons.

   c. Write on the board the following format for deciding on the following situations:

      (1). I would like to do this. + 2 points
      (2). I would agree to do this. + 1 point
      (3). I would rather not do this. - 1 point

      Each of the following situations should be decided upon by scoring all of the children's responses by giving 2 points for each #1 response, 1 point for each #2 response, and take away 1 point for each #3 response. Add up all the scores together and see how most of the children feel.

d. Hopefully you can adjust each question to a real situation in your class, so that the students actually make decisions based upon everyone's feelings. Some students won't agree with the majority of the class and it is important that their feelings help determine any final decisions. Many decisions can directly benefit most of the class and yet still be adjusted to benefit, in possibly a smaller way, other students not initially agreeable to the decision formed by most of the class.

e. For each of the following questions, have the class suggest alternatives to consider, and then vote on these alternatives using the scoring system described. Try to adjust each decision to, in some way, be favorable, interesting, and valuable for everyone.

(1). Where should our class go for a field trip (walking, car pooling, buses)? And what should we do on the field trip?

(2). What types of fund raising projects could we do to raise money for school site plantings? What should we buy with our money when we raise it?

(3). What classroom activities or subjects should our class work on next?

(4). What people in the community would you like to invite to come and speak to our class?

(5). What classroom presentations (assemblies, for other classrooms) would we like to do? Which are most appropriate for our class at a certain time like: Christmas, Fall, Spring, Earth Week, etc.?

f. Make up other questions yourself or have the class suggest other issues to decide on in class.

6. Discussion Questions:

a. How do you feel when a group, of which you are a member, decides to do something without listening to or considering your feelings before deciding?

b. Do you think more people feel good about decisions if they are made in a similar way to the way your class decided on the issues in this activity?

c. Do you feel comfortable in expressing your feelings about a particular issue in your class? If not, what things hinder you in expressing yourself, and how do you think the situation could be improved?

d. What decisions do you recognize in your community that weren't made by considering all or most people's feelings? How do these decisions benefit some people much more than other people, and even turn out unfavorable for some people?

e. Do you feel that our government representatives (Senators, Congressmen, City Council, etc.) keep in touch with the feelings of the people they speak for? How might people, like yourselves, help your representatives keep in closer touch with your feelings, and the people around you?

Middle Elementary

Marilyn Masouredis

Animal Puppets, People, and Rights

1. Concept to be developed: Environmental Decisions

2. Understanding to be developed: Your personal feelings and the feelings of others should be considered before you decide to act.

3. Time: 3 days - day 1 - make puppets
   day 2 - puppet show
   day 3 - discussion

4. Materials: Old but clean well darned socks.
   Buttons, felt pieces, cotton, odds and ends, needles and thread.
   Very large box, paint, glue, twigs, clay, string, cardboard, and construction paper.

5. Procedure:

   a. The children are going to put on impromptu hand puppet shows involving people animals and their habitat.

   b. They can select any puppet character they wish to make. The following list is an example:

Deer	Rabbit
Chipmunk	Beaver
Squirrel	Bird (any kind)
Fish	Frog
Man	Etc.

   c. Give a short demonstration on how to thread a needle, knot the thread, sew on the necessary pieces and identifying characteristics that will construct characters. For example, a rabbit has long pointed ears, a squirrel has a bushy tail, etc.

   d. The stage can be a large box with the front and back removed. Paint the sides, top, and bottom with an outdoor scene. With paper, clay, twings, string, sponge, and glue create some trees and shrubs. A curtain can close the back of the box so that the performers can conceal themselves except for their hands which will support the hand puppets.

e. The children can put on several impromptu plays with this stage and these puppets. Before each production they are given a situation involving a change and an alteration in the environment. They should select the puppet characters needed for that particular situation. For example:

Situation	Characters
Sewage dumped into a fresh water pond.	Man, fish, frogs, beaver
Wooded area stripped for housing development.	Man, birds, squirrels, deer, chipmunks, rabbits, beaver
Wooded area cleared for farming.	Man, squirrels, etc.
Have the children present some situations.	

6. Discussion Questions:

a. When a change took place in one of our situations (name a specific play) who was effected by it? Were all our characters helped by the change? Who was helped and who was not helped?

b. Is it possible to make changes in the environment and make everyone happy?

c. How can man continue to dispose of his waste, and feed, cloth and shelter himself with the least amount of disruption to his environment?.

Protecting Our Water

1. Concept to be developed: Environmental Ethics

2. Understanding to be developed: If human beings protect the earth it will be able to continue to support a diversity of living things.

3. Time: approximately three weeks.

4. Materials. Children's books, large paper for wall charts, magic markers, stars, art materials, equipment for experiments.

5. Procedure and Discussion questions:

   a. List as many uses as you can think of for clean water. Children write ideas on large papers on blackboard. Use books, people, and observation for ideas.

      1) Put gold stars next to human uses to support life.
      2) Put blue stars next to human uses for enjoyment.
      3) Put green stars next to non-human uses.

   b. List as many ways as you can think of to spoil (pollute) water. Use books, other people and observation for ideas.

      1) Put yellow checks next to pollution that would affect human survival.
      2) Put blue checks next to pollution that would spoil human fun.
      3) Put green checks next to pollution that would spoil non-human life or environment.

   c. Class discuss and teacher list as many ways possible for we as individuals and families to help keep water clean. Use books, other people and observation for ideas.

      1) Every student chooses two ways to keep water cleaner: one personal project, one family project.
      2) Make individual check-off lists to follow profess of clean water project improvement for two weeks.
      3) Evaluate progress:

         a) Evaluate individually with teacher after two weeks. Modify, change or continue project as is for two more weeks.

         b) Evaluate final time. Share results with class.

   d. Draw crayon, chalk or magic marker pictures showing many ways water is polluted. Display on bulletin board.

e. Write one of the following stories:

1) What would happen in our city if all the water slowly became unusable?
2) What would happen in a forest if all the water slowly became unusable?

f. Experiments:

1) Mix water with many visible pollutants that children bring to class (sand, leaves, pebbles, oil, milk, etc.). Discuss.
2) Mix water with invisible pollutants (salt, sugar, chlorine, other chemicals, etc.). Discuss.

g. Field trip:

1) Visit a site where humans or human negligence are causing water pollution.
2) Visit or have a representative from local water treatment plant explain local water supply.

h. Study map showing source of local water supply and method of disposal.

i. Collect pictures from magazines, newspapers and old texts to make a huge scrapbook showing all things that will benefit from clean water.

1) Write one sentence under each picture telling why it matters that water is clean.
2) Place this large scrapbook in prominent place in library.

7. References.

a. People and Their Environment, Teacher's Curriculum Guide to Conservation Education. M. J. Brennan, J. G. Ferguson Publishing Co.

b. A Multidisciplinary Teacher's Guide to Man and Environment; New Jersey Education Association.

c. Let's Try It: Girl Scouts of USA, New York.

Save the Spaceship

1. Concept to be developed: Environmental Ethics

2. Understanding to be developed. If human beings protect the earth, it will be able to continue to support a diversity of living things.

3. Time: 1 day or more as needed.

4. Materials:

   a. Film: Buttercup - 13 min., color, non-verbal ecology film. A rich visual experience. (1971).

   b. Chart paper and markers.

   c. Art Supplies:

      1. Mural paper.
      2. Paint.

5. Procedure:

   a. Provide each student with a handout which they are to write down the various environmental problems they see.

   b. Briefly introduce film: Buttercup, without telling students the title. 13 min.

   c. After the film showing, have the class break up into groups of 5 to compare their list of environmental problems cited in the film. Have each group develop a single list of common environmental issues cited and have each group present their list to the other teams. Teacher should record on chart paper similar environmental problems compiled by the teams.

   d. Have each group discuss the purpose of the film - what was the message to humanity - ask students why the film was titled Buttercup.

   e. Discuss that human beings must be protectors of the earth so that living things like buttercups can survive and continue to bring beauty to the world.

   f. Have students investigate the school site for any visible signs of our society misusing spaceship earth.

g. Have each group develop a mural expressing their views on how the spaceship should be managed.

h. Discuss the term pride with the class, showing how pride plays a very important role in the protection and continuation of spaceship earth.

6. Discussion questions:

a. What does pride mean?
b. What does nature mean?
c. What is life?
d. What is a flower?
e. How did you feel about the film?
f. Why was the film without words?
g. Where was the buttercup going?
h. Where did the buttercup come from?

7. References:

Educational Films, 1973. University of Michigan.

Middle Elementary Talbert B. Spence

Solid Waste? What's That!!

1. Concept to be developed: Environmental Ethics

2. Understanding to be developed. Humans can be "stewards" of the earth, rather than careless exploiters of it.

3. Time: 2 or more days.

4. Materials:

   a. Garbage bags.
   b. Cameras.
   c. Films: a. The Garbage Explosion 16 min.
      b. Garbage. 11 min.
   d. Art paper and paint.
   e. Cassette tape recorders.
   f. Chart paper and markers.

5. Procedure:

   a. Introduce and show 11 minute visual essay "Garbage" to class. Use this film to intiate some discussion about who is responsible for the maintenance of the earth.

   b. After students view film ask them to relate what they saw in the film - teacher records this on chart paper - Ask class if any of the garbage shown in the movie can be found around the room.

   c. Discuss the reasons for trash in the room and in individual students desk and lockers. List responses on chart paper.

   d. Have students armed with large litter bags first clean up the the classroom of any trash, then let them loose on the hallways of the school picking up visible trash.

   e. Have students bring back to the room their trash bags and quickly investigate the contents of the litter bags. Teacher should list on blackboard the kinds of things found and place them in catagories, e.g. reusable 1) paper, 2) glass, etc.

   f. After the experimental clean up show second film: "The Garbage Explosion" 16 minute color film dealing with man's influence on his environment through technology.

   g. Discuss the issue of man's over-production has caused society to throw away valuable resources.

h. Have students divide into groups of five to do an investigation of solid waste conditions in the neighboring community. Students should have cameras and cassette tape recorder to take pictures and interview community people.

i. Have student groups gather their data for presentation to class and possibly to other students in the school.

j. Have students construct a large mural depicting solid waste problems in the school and community.

6. Suggested follow-up activities:

a. Waste glass - candle holders -art- & craft project: refer to ECO: A Handbook of Classroom Ideas to Motivate the Teaching of Elementary Ecology. by Charles E. Hamilton.

b. Anti-litter poster campaign & contest: have students develop original slogans and messages supporting an anti-litter policy in the school.

7. Reference:

a. Educational Films, 1973. University of Michigan.
b. ECO: A Handbook of Classroom Ideas to Motivate the Teaching of Elementary Ecology. by Charles E. Hamilton. Pub. Educational Services Inc., P.O. Box 219, Stevensville, Michigan.

Stewardship

1. Concept to be developed: Environmental Ethics.

2. Understanding to be developed: humans can be "stewards" of the earth, rather than careless exploiters of it.

3. Time. 9 days - day 1 - Department of Natural Resources speaker
   day 2 - discussion/explanation of project and parental permission forms.
   day 3 - detailed explanations of projects
   days 4 & 5 - pass-outs and progress check
   days 6 & 7 - home project work continues
   day 8 - debriefing
   day 9 - further discussion

4. Materials. Cooperative Extension Service basic Environmental Conservation materials, Johnny Horizon materials, DNR Forest Fire Division materials, paper bags, copies of the following:

Form A

Environmental Survey Chart

You will be looking around your house, school, and town and checking on the following things. At the end, we will add up the numbers, and you will have a score. Let's see what kind of earth being you are.

	Number of pieces --	Scale for Points (acc. to no. of pieces)	Total Points
1. Litter on street - in school -		0 - Perfect - 0 1-10 Excellent - 5 11-20 Good - 10 21-25 Fair - 50/26 + Poor - 100	
2. Garbage - messy piles - uncovered cans construction debris -		0 - Perfect - 0 1-5 Excellent - 10 6-10 Good - 25 11-20 Fair - 50 21 + Poor - 100	
3. Defacement to road signs to walls to desks, etc. broken windows		0 - Perfect - 0 1-5 Excellent - 10 6-10 - Good - 25 11-20 Fair - 50 21 + Poor - 100	

NOW TOTAL YOUR POINTS AND USE THIS SCALE:

Perfect - 0
Excellent - 1-25
Good 26-55
Fair - 56-150
Poor - 151+

Form B

Pollution Problems	How to Solve	Solution Actually Used

Form C

Car vs. ?

First two days - Number of times car was used

Second two days - Number of times car was used

Did the number decrease? or increase? by how much? What are your feelings?

5. Procedure:

   a. Schedule a DNR speaker for classroom talk on ways people mis-use our environment (if a city school, plan field trip and incorporate talk and trip together). After the talk in the room, arrange a trip around the school area to show and have the children find destruction caused by people.

   b. Review the DNR speaker's talk - emphasize things your class can control themselves.

   c. Allow the children to choose one of the following activities to be completed with parental permission and help (be sure to send home project plan copies and permission slips):

      1) Find a heavily littered area that you can clean up and possibly plant flowers there.

      2) Take an environmental survey of your surroundings and use Form A to record your findings.

      3) Find three examples of air, water, or noise pollution in your family surroundings or neighborhood and try to clear up those problems.

      4) Tally two days of your families use of any motorized vehicles. Then try to suggest ways to lower this number of times used, keep another two days tally and compare to the first one. Use form C to record on.

5) For two days tally the amount of paper and lights or electricity sources left on when not in use. Then for two days see if you can limit your waste and keep another tally.

d. After the return of the signed parental permission slips, break the children into groups according to their choice, and explain in detail their specific project also giving out the needed forms.

e. In the two day span, pass out materials and hold discussions about being 'stewards' of the earth. Also check progress and problems.

f. On the final day, collect the charts and allow enough time to completely discuss the basic concepts they found.

g. After evaluation of forms, spend one day having them share their findings - using the forms, experiences, etc.

6. Discussion Questions:

a. Did you find it difficult to complete your project? If so which part or parts?

b. Did your family help you and cooperate on your project?

c. Did you feel 'good' about doing something good for your earth?

d. Do you feel children can help to keep our country beautiful?

e. Besides these five projects our class did, how else can we be stewards of the earth/ e.g., littering, limiting destruction, recycling drives, caring for our pets and plant life.

f. What will happen to our trees if we don't take care of them?

g. What will happen to our water if we don't take care of it?

h. What will happen to our air if we don't take care of it?

i. What will happen to our soild if we don't take care of it?

j. Would it be easy to do something for our earth everyday of our lives?

k. Do you think everyone should start to care for our earth?

7. References:

Environmental Learning Experiences for Grades 3 and 4, prepared by Center for the Development of Environmental Curriculum, Willoughby Eastlake City Schools, Willoughby, Ohio.

Middle Elementary — Talbert Spense

Land Use In The Community

1. Concept to be developed: Environmental Ethics

2. Understanding to be developed: Humans can develop both a way of thinking and feeling about the earth if we are to live harmoniously with each other and our environment.

3. Time: Several days.

4. Materials:
   a. Cameras
   b. Chart paper and magic markers.
   c. Crayons and paper.
   d. Poster board and paint.
   e. Cassette tape recorder.
   f. Slide projector.

5. Procedure:

   a. Show students various pictures of community environmental problems. Have students discuss how these problems were created and why. Use the chart paper record and post the responses along side each picture.

   b. Ask students if there are any similar community environmental problems in the school's community; write down the responses on chart paper and also place key words that seem to come up often for possible spelling vocabular list.
      (e.g. pollution, garbage, trash, paper, pop cans, etc.)

   c. Have students in teams of six (6) survey the immediate school site for any of the suggested items in #b. Have each group take slide pictures of each problem they find.

   d. Have the developed slides of the school-site's environmental problems and show them to the class. Discuss whether the problems identified by the students are bad and if so what are some ways to change them and enhance the school's visual appearance.

   e. Discuss who might have created the problem in the beginning and who should be responsible for the cleaning up and maintaining a good school site appearance.

f. Have students draw pictures of how they would as individuals be responsible for cleaning up the environmental problems around the school site.

6. Follow up activities:

a. Have students observe the land and housing in the neighborhood of the school.

Ask these questions:

1. How is land used?
2. Is some of the area covered by concrete buildings and asphalt?
3. Is any of the area set aside for playgrounds?
4. Who takes care of the land?

b. Have students observe neighborhood alleys to assess the possible or apparent effects that humans not being responsible has caused to the visual appeal of the neighborhood.

c. Discuss what happens when rain hits the concrete and asphalt.

Ask these questions:

1. Does it soak in?
2. Where does it go?
3. What affects are there on the existing plant and animal life?

d. Help students develop a slide show presentation on what they found during their investigation of the communities environmental problems to the total school.

e. Assist students in putting on a play which reflects their sensitivities, fears, and awareness about the lack of human responsibility for the natural and human environments.

7. Discussion questions:

a. What happens when it rains on concrete and asphalt?

b. What should be the role of parents in terms of maintaining an attractive neighborhood?

c. Do you care about the survival of existing animals and plants in neighborhood?

d. In what ways do you show responsibility for your neighborhood?

Algae and Stream: Values

1. Concept to be developed: Environmental Ethics

2. Understanding to be developed. Humans can develop both a way of thinking and feeling about the earth if we are to live harmoniously with each other and our environment.

3. Time: Five days Day 1 - film on stream algae or visit stream with algae
Day 2 - Begin algae experiments and chart.
Day 3, 4, 5 - Observe algae experiments, record data.
Day 5 - Discuss data.

	Jar 1 water	Jar 2 water & soil	Jar 3 water soil fertilizer	Jar 4 water fertilizer
Monday				
Tuesday				
Wednesday				
Thursday				
Friday				

4. Materials: Lawn fertilizer, 1 #, 4 glass quart jars, canning type, soil - 2 cups, measuring cup.

5. Procedure:
   a. Go to a nearby stream or pond and view algae growth or view film for effect of algae in streams to motivate interest.
   b. Discuss background information in film.
   c. Divide class into four groups.
      1) Group I prepares a jar of 3 cups water.
      2) Group II prepares a jar of 3 cups water, 1/2 cup soil.
      3) Group III prepares a jar of 3 cups water, 1/2 cup soil, 2 T. fertilizer.
      4) Group IV prepares a jar of 3 cups water, and 2 T. fertilizer.
   d. Provide a chart for each student.
      1) Record data.
      2) Record observation of jars.
   e. Discuss observation of changes in jars.

6. Discussion questions.

   a. What is algae and how is it formed?

   b. Is algae beneficial or non-beneficial to a stream according to the film?

   c. Without algae present in a stream what kinds of wildlife would be around the stream? In the stream?

   d. With algae present in a stream what kinds of wildlife around the stream? In the stream?

   e. How does the lack of game fish in a stream affect the wildlife around the stream?

   f. Discuss our charts and observations related to the experiments:

      1) Is algae present?
      2) In which jar is it most present?
      3) What jar if any does not have algae present?
      4) Is an odor present from the jars?
      5) How does the algae look?

   g. Can you draw any inferences between how we live and what we use, and how we use it? Can this affect the lives of people we don't know and wildlife we can't see which live downstream?

7. References: Deciding How to Live in Spaceship Earth. 1971. Plover Books Winona, Minnesota. Rodney F. Allen, Carmela P. Fotz, Daniel M. Ulrich, Steve Woodard.

Section II

Middle Elementary Skill Developing Activities

73/74

SECTION II

Introduction to Skill Developing Activities

The development of problem solving skills is essential if students are going to actively participate in environmental problem solving as responsible citizens.

Eight skills have been identified as being essential to the environmental problem solving process and for each of the eight skills, skill developing activities have been designed for each of the following grade categories: early elementary (K-2); middle elementary (3-4); upper elementary (5-6); junior high; and senior high.

The eight problem solving skills are the ability to:

1. listen with comprehension;
2. recognize environmental problems;
3. define environmental problems;
4. collect information;
5. organize information;
6. analyze information;
7. generate alternative solutions; and
8. develop a plan of action.

After becoming acquainted with the following skill developing activities, you may want to develop some of your own, keeping in mind that they should be designed to be integrated into and coordinated with your existing curriculum rather than be used as units by themselves.

Middle Elementary James E. Smith

Pollution Sticks

1. Skill areas to be developed:

   a. The ability to recognize a problem.

2. Time involved: 10 min. - game
   20 min. - explaining and reviewing

3. Material needed:

   a. 31 pick-up sticks with colored markings on them.

Sticks		Color	Points
1	Man	Black	60
5	Water Pollution	Blue	10
5	Waste	Green	6
10	Energy Crisis	Red	2
10	Air Pollution	Yellow	5

   B. Object of the game: the player tries to pick up as many sticks as possible (one at a time) without moving the other sticks.

   c. Add up points. The black stick may be used to help pick up other sticks.

   d. Demonstrate to the students that no matter which stick they start with or collect (water, waste, etc.) the problem centers around the Black stick (man) and MAN is the one to solve the problem.

4. Recommended procedure:

   a. Divide class into groups, 3 persons to a set of sticks.
   b. Pass out sticks.
   c. Follow directions to pick up sticks.
   d. Two people watch and keep time, the other person then tries to pick up as many sticks as possible without moving the other sticks.

5. Discussion questions:

   a. Which stick is the most important to get? Why?
   b. When solving an environmental problem, what role does man play?

Middle Elementary

Bill Shockey

Rural, Suburban, Urban Environmental Problems

1. Skill areas to be developed:

   a. Ability to identify an environmental problem.

2. Time involved: 30 min. - 60 min.

3. Materials needed. several popular magazines

4. Recommended procedure:

   a. Look through several magazines and cut out selected pictures of a rural, suburban and urban scene in which several environmental (or potential environmental problem) problems are illustrated.

   b. Have the students view each of the pictures for a brief period of time and have them list the following.

      1. What are three things that you like about each picture?

      2. Do the pictures illustrate any serious environmental problems? Identify any problems that you see in each of the pictures:

         a)
         b)
         c)

5. Discussion questions:

   a. How can the problems be lessened?

   b. Who or what has caused the environmental problems?

   c. How many different environmental problems were identified?

   d. Why were some students more effective in identifying environmental problems than others?

Middle Elementary Mary Garver

Homonyms

1. Skill areas to be developed:

   a. The ability to define a problem.

2. Time involved: 30 minutes-a class period.

3. Material needed: Pencil and paper for each student.
   Lists of homonyms for teacher's use.

   a. Eye
   b. Ate
   c. Dew
   d. See
   e. Two
   f. Bare
   g. Lone
   h. One
   i. Male
   j. Pane

4. Recommended procedures:

   Read the list to the class as you would a spelling test; however, do not use any of the words in a sentence.
   After the list has been read, reread the same words in the same order but this time use each word in a sentence which makes clear which homonym is asked for. Have the students rewrite any words they misused.

5. Discussion questions:

   a. Did you need to change any of your words the second time you heard them?

   b. Why?

Middle Elementary

David H. Sandys
Richard D. Sandys
Ron Garner
James D. Obenour

Data Collection Through Drawing

1. Skill area to be developed:
   a. The ability to collect data.
2. Time involved: One hour.
3. Materials needed: Each person should have the following:
   a. A sheet of drawing paper folded into thirds each way to make nine sections.
   b. A pencil
   c. Crayons
4. Recommended procedures:
   a. Have a selected list of alphabet letters on the board.
   b. Have pupil write one letter in each square on his paper.
   c. Give the following directions for the exercise.
      1. Go outside and find something that begins with the letter you have put in each square on your paper.
      2. Draw a picture of the thing you find for each letter.
      3. Print the name of the item drawn in the square under the drawing.
5. Discussion questions:
   a. Tell the class about one of the things you have drawn
   b. Did you draw things you like or dislike? Why?

Middle Elementary

Blanche Edelman
Doris Jones
Demitra Balmer

P.S.
(Pollution Statements)

1. Skill area to be developed.

   a. The ability to organize data.

2. Time involved: 30 minutes

3. Material needed: Sheets with the following environmentally related statements: .

   a. Many people like to burn their leaves in the fall of the year.

   b. In spite of warnings about danger to one's health, many people still smoke cigarettes.

   c. It's very warm out today.

   d. While driving to work I saw several people throw gum wrappers, cigarettes or other trash on the sidewalk.

   e. The car ahead of my car had heavy black exhaust coming from its tail pipe.

   f. I saw a robin this morning.

   g. Many ads encourage people to use low phosphate soap powder for washing clothes.

   h. Some industries dump sewage in nearby waterways.

   i. As we looked through the windows we saw lots of smoke coming from the smoke stacks.

   j. There seemed to be oil slicks on the water.

   k. The record player was way too loud.

   l. The muffler needed replacing.

   m. The windows were opened and the machinery sounds could be heard a block away.

   n. They were already sorry they had built their house so close to the airport.

   o. She used a great deal of pesticide spray.

p. He was putting new filters in his furnace.

q. It was a good band but we couldn't talk while they were playing.

r. The parking lot is crowded today.

s. She was shaking her dust mop from the window.

t. We saw many dead fish on the beach.

4. Recommended procedure.

a. Give each member of the class a sheet containing the above environmentally related statements.

b. Allow 10 minutes for reading over list and adding their own statements which could concern any area of the environment or be an irrelevant statement.

c. After 10 minutes, divide the class into groups of five.

d. Give the following directions:

1. In each group one member will record air pollution, problems, one water pollution problems, one noise pollution, one all other environmental problems, and one irrelevant statements.

2. Each one taking a turn, the statements will be read and the group decides where it should be recorded. The record is kept on the statement sheet by placing a check in front of that statement.

(Ex. Statement "a" would be checked by the Air Pollution recorder).

f. Continue until all statements have been read or until time has been called.

g. Check answers for first 20 statements.

Air - a, b, e, i, o, p, s, l - may be either air or noise.

Water - g, h, j, t.

Noise - k, m, n, q.

Other - d

Irrelevant - c, f, r.

h. Start with group (1) and have the Air Pollution person read one of his added statements. See if any other group had something similar.

i. In group (2) do the same for a water related item.

j. In group (3) use noise statements.

k. In group (4) use other types of pollution.

l. In group (5) use an irrelevant statement.

m. After each group has given one, talk about how controversial statements were dealt with.

5. Discussion questions:

a. Did you have any problems deciding where statements should be grouped?

b. What questions did the students have regarding some of the statements?

Middle Elementary

Doris J. Jones
Blanche Edelman
Demetra Balmer

Five-in-One

(Five groups of words are combined to form a master list which is arranged alphabetically).

1. Skill area to be developed:

    a. The ability to organize data.

2. Time involved. 45-50 minutes

3. Materials needed:

    a. Paper

    b. Pencils

    c. Printed cards containing all the words covering the five topics (i.e., things found in a city, in an automobile, at home, at school, and on a farm).

    d. A master list arranged alphabetically is attached to the end of this paper.

4. Recommended Procedure:

    a. Divide the class into groups of five.

    b. Each group selects a captain who will oversee the final alphabetical master list.

    c. Each participant will decide which topic he/she will work on.

    d. Each participant is then given 15 minutes to find all the words from the pile (which is located in the center of the group) that belongs to his particular topic and arrange these alphabetically.

    e. The next 20 minutes are set aside so that all words can be combined to form the alphabetical master list.

    f. The last 5 minutes will be a discussion period involving all participants of the group.

5. Discussion questions.

    a. How did the organizing proceed at the beginning of the group? Such as:

1. Selecting a captain.

2. Deciding who should get a topic if more than one person wanted it.

b. Did you find that some words could belong to more than one list? If so, who made the final decision to what group the word should belong?

c. Did the group function well together?

d. If you were to find yourself in this type of situation again, what would be some of the changes you feel could be improved or eliminated?

e. Did you enjoy the game?

This is an alphabetical list of all the words used in the game. A number after a word indicates the possible number of times that particular word should be printed for use in one of the five main topics.

Aide
Air-conditioner 4
Airport
Alley
Apartment
Ash tray 2
Avenue
Barn
Basement 2
Battery
Bed
Bell
Blinds 2
Blinkers
Bookcase 2
Books 2
Brakes
Bridges
Cabinet 2
Car 4
Carburetor
Carpet 3
Cat 3
Chair 2
Chicken
Children 3
Church
Cinema
Class
Closet
Clothes line
Cookware
Couch
Crowds 2
Cylinder
Defroster
Desk 2
Dishes
Dog 2
Door 3
Drapes 2
Dress
Drinking fountain
Driveway
Duck
Expressway
Filmstrip
Filter
Flower garden 4
Food 3
Freezer 3
Fruit tree 2
Garage 2
Gasoline
Gear-shift
Gutter 2
Hallway
Headlight
Headphones
Headrest
Heater
Hen house
Hood
Horses
Houses
Hub caps
Ignition
Jail
Lakes
Lamp
Lawn 3
Lighter
Lunch room
Mailbox
Mats
Mirror 3
Motor
Movies
Mowers
Offices
Oil
Paintings 2
Paper
Parents 2
Parking lot 2
Park
Pencils 2
Pets 2
Pictures
Pigs
Plants 4
Playground
Policemen
Pollution
Ponds
Porch
Post office
Principal
Projectors
Radiator
Radio
Railroad
Record players 2
Refrigerator
Restroom
River
Ropes
Safety belts
Safety building
School
Seats
Shades
Shade trees
Shopping centers
Sidewalks 3
Silo
Silverware 2
Spar. plugs
Stage
Steering wheel
Stereo
Stop signs
Stove
Streams 2
Street curves
Street lights
Tables 2
Tape players 3
Teachers
Telephones 4
Televisions 2
Theater
Tires
Tool shed
Tractor
Traffic lights
Traffic signs
Trampoline
Trees 4
Trunk
Turkeys
Vegetable garden 2
Vents
Vinyl
Volleyball
Volunteers
Windshield

Middle Elementary

Tim Kardatzke
Tim Kreps
Don Hellinger

Weather Chart

1. Skill area to be developed:

   a. The ability to analyze data.

2. Time involved: 30-45 minutes.

3. Material needed: One sheet of paper with the same data as the "classroom weather chart" for each student.

   For a period of one to two months prior to the weather unit, the class, with the aid of the teacher will compile a weather chart. This chart should be large and prominently placed on a wall or bulletin board. Data, collected at 8:30 AM, 11:00 AM, and 3 PM daily, will include temperature, and cloud cover (sunny, partly cloudy overcast, rain, snow). The temperature readings are recorded as a line graph, with the sky conditions printed below each temperature.

4. Recommended procedure.

   a. Form the class into groups of six.

   b. Pass out the sheets for each with the weather chart (one sheet for each member of the group).

   c. Give the following directions:

      1. The weather chart on your paper is the same as the one we have been making for the last two months.

      2. Try to decide if the temperature changes when the amount of sunshine changes.

   d. Give the groups time to explore the general question while you visit each group to answer their questions.

   e. Call the class to order so they can share their ideas.

   f. Ask any group to tell if the days have geen getting warmer or cooler since the first readings were taken.

   g. Ask if one time of the day was usually warmer than other times.

   h. Ask if a cloudy day was much warmer or cooler than the next sunny day.

   i. Ask if the temperature became higher or lower when it rained or or snowed.

j. Analysis of the data should bring forth the following ideas:

1. Temperatures get higher in the springtime or the temperature gets lower in the fall (depending on when the chart is made).

2. Temperatures are warmest in the afternoon.

3. Cloudy days don't get as warm as sunny days.

4. Sometimes the temperature goes down when it rains or snows.

Middle Elementary

Erv. Doman
Bill Plummer
Cim Murnen

Tools of Your Trade

1. Skill areas to be developed:

   a. Ability to work with a group.
   b. Ability to develop alternatives.

2. Time involved: 30 minutes

3. Materials needed: Cards of Worker and Tool:

   Card #1 - Worker is a teacher; tool is a book. List other tools a teacher may use.

   Card #2 - Worker is a carpenter; tool is a hammer. List other tools a carpenter may use.

   Card #3 - Worker is a secretary; tool is a typewriter. List other tools a secretary may use.

   Card #4 - Worker is a cook; tool is a pancake turner. List other tools a secretary may use.

   Card #5 - Worker is a painter; tool is a paint brush. List other tools a painter may use.

   Card #6 - Worker is a school custodian; tool is a dust mop. List other tools a school custodian may use.

4. Recommended Procedure:

   a. Form groups of six students.
   b. Provide each member of a group with one card.
   c. Give the following directions for the exercise:

      (1). Each member of a group is to list as many alternate tools as possible on his card.
      (2). Members may switch cards when they have exhausted their own resources.
      (3). Set a time limit for the exercise.

5. Discussion Questions:

   a. How was the leadership of a group established?
   b. How were decisions made?
   c. Was a time limit set for each member for his card?
   d. How was decision made by the group whether the list of tools on the cards were appropriate to the worker?

Terrariums

1. Skill area to be developed:

   a. The ability to make observations.
   b. The ability to draw conclusions.

2. Time involved: approximately 2 weeks.

3. Materials needed:

   a. soil
   b. small plants
   c. jar
   d. cork or plastic wrap
   e. water
   f. pebbles
   g. charcoal
   h. tag board
   i. tape
   j. spoon
   k. popsicle sticks
   l. rubber bands
   m. tweezers
   n. hanger

4. Recommended procedure:

   a. Have each child make his own terrarium, if not, have the class make at least two. (Wide necked containers like peanut butter or mayonnaise jars are easier to handle. The bottle must have a covering a cap, a glass plate, plastic wrap, or a cork.)

   b. Using the funnel,pour a layer of pebbles (for drainage) into the bottle and add a few bits of charcoal to keep the garden odor-free. In a small bottle, the depth should be an eighth to a quarter of an inch; in large bottles, it can be two or three inches. Shake the bottle to spread drainage evenly. Then pour in a commercial sterilized soil to a depth of at least a half-inch in small bottles and as much as three or four inches in larger ones. If commercial sterilized garden soil is not available, use any fine soil to which fine sand has been added. Spread and pack the soil with a tamper (cork attached to a piece of wood). With a shovel (spoon) dig a hole for each plant. Lower each plant carefully into the bottle. When the garden is planted, pour water through the funnel until the water level reaches the top of the drainage material. Place a cover on the bottle. If the soil surface is dry the following day, add more water. If the glass sides are covered with water drops, there is too much water, and the top should be removed for a day. Repeat this procedure until a light vapor appears only at night. Never set the bottle garden in direct sunlight.

c. Have the children observe the terrariums over a period of two weeks. Ask the class to make a list of the elements in their terrariums that seem to work together cooperatively. Bring to the class's attention that once the terrariums are air-tight, the elements must depend on each other in order for the plants to survive. For example, the sunlight helps the plants to grow and make food. During the process of making food, oxygen is created. The soil not only holds the plants upright, but also provides the nutrients necessary for the plant to make food. Water is used by the plants. During the food-making process, water is given off in the form of water vapor. This vapor condenses and returns to the soil to be used again.

d. After two weeks have some students who volunteer cause an upset in their terrariums by using one of the following conditions:

1. Have a few students pinch off parts of leaves. (Equate this experiment with students climbing trees and breaking off branches.

2. Ask one student to place too much water in his terrarium.

3. Ask another student to stop watering.

4. Ask a student to use polluted water in his terrarium (soap).

5. Have another student place litter in the terrarium.

Allow the class to observe these upsetting conditions.

5. Discussion questions:

a. Where do the plants get water?
b. How can the plants make food?
c. What effect does the students' disruptions to the terrariums have on the plants?
d. What effect do students have on the trees and shrubs on the school grounds?
e. How can balance to the terrariums be restored?

References:

The Toledo Blade, Sunday Home Section, 1974, (February)

Middle Elementary

Tim Kreps
Donn Hellinger
Tim Kordazke

How Fast Does it Grow?
(Comparing the growth rate of plants in different environments)

1. Skill areas to be developed:

   a. The ability to recognize a problem.
   b. The ability to define a problem.
   c. The ability to collect data.
   d. The ability to organize data.
   e. The ability to analyze data.

2. Time involved: Growing period of a seed (bean works well).

3. Materials needed:

   a. Six glass receptacles, one for each seed.
   b. Six seeds.
   c. Ruler, meter stick or camera.
   d. A dark closet or a box.
   e. Bulletin board to display measurements or pictures.

4. Recommended procedure:

   a. Plant each seed in a glass receptacle next to the side so that the root growth below the surface may be observed. (follow planting directions).

   b. Put 2 receptacles next to the classroom windows.

   c. Put 2 receptacles as far away from outside light as possible (the other side of the room, etc.).

   d. Put 2 receptacles in a dark closet or on a desk covered completely by a box.

   e. For convenience label the plants: window plants A & B, room plants A & B, box plants A & B.

   f. Follow directions for watering the three "A" plants, being sure to give equal amounts of water to each "A" plant and to water all three at the same time.

   g. Water the three "B" plants when the three "A" plants are watered <u>but</u> give each "B" plant only half the amount of water that each "A" plant receives.

   h. Measuring and watering are good student responsibilities.

   i. Form the class into 6 groups.

   j. Each group is responsible to measure the growth of one of the plants. They are to record and organize their information.

k. The teacher may not want to divide the class into groups. In that case, students should rotate the responsibility of recording the plants' growth rate.

l. As seeds grow, record the growth of each. The following methods are suggested:

1. Take pictures, a picture of each on the same day.

2. Measure growth with a ruler or meter stick.

3. Use different length and color segments of yarn or rope to compare amount of growth on a bulletin board.

m. After all data is collected and organized, the teacher will lead the discussion.

5. Discussion questions:

a. What have we learned about the growing conditions of a plant?

b. What makes a plant grow slower or faster?

c. Which one grew faster? Why?

d. Which one grew slower? Why?

e. All "A" plants received the same amount of water. Why didn't they all grow at the same speed?

f. Is water the only thing necessary for a plant to grow?

h. What else is needed?

i. Did the sun help window plant "A" to grow faster than the other two "A" plants?

j. Did window plant "B" grow as fast as window plant "A"?

k. Does the amount of water a plant receives help it to grow?

Note: Discussion suggestions:

1. Discuss as an entire class.

2. Form discussion groups of 5 to 6 students and give them discussion question "a" and also question "b", depending on the group). Ask someone to record their thoughts (either on paper or a tape recorder) so that they can share their ideas with the other groups. The teacher will want to move around the room asking further discussion questions of those groups who are having trouble getting started.

Middle Elementary

Ervin Doman

Resource Problem

1. Skill areas to be developed:

   a. The ability to recognize data.
   b. The ability to organize data.
   c. The ability to analyze data.
   d. The ability to make group decisions.
   e. The ability to provide alternate solutions.

2. Time involved: 30 minutes

3. Materials needed: Information supplied on a printed sheet of paper.

   a. Data: A family has two boys, two girls, a mother and father and a grandmother.
   The mother sews for everyone; she has a large sewing machine.
   One of the boys likes to do wood carving.
   One of the girls and the other boy like to sing and play the guitar.
   One girl is practicing to be a cheer leader.
   Grandma needs to rest a good deal.
   Father works from 4 p.m. until midnight, and sleeps from 2:00 a.m. until 9:00 a.m.
   Their house has three bedrooms, one living room with a fold-away bed, a kitchen with a dining area, and a bathroom.

   b. Problem: How can people in this family plan their use of space so that each person can do what he or she needs to do and wants to do?
   Where and when will each eat, sleep, work and enjoy his activities?
   List as many alternative solutions as you possibly can when you solve the problem.

4. Recommended procedure:

   a. Form the class in groups of 4 or 5.
   b. Pass information to each group.
   c. Give the following directions for the exercise:

      (1). Each group solve the initial problem.
      (2). Each group assign a recorder for the group.
      (3). Each group try to have at least one alternate solution to the problem.

5. Discussion Questions:

   a. How was the recorder chosen?
   b. How were the decisions made?
   c. Did all members contribute to solutions?
   d. Were alternative solutions easy to find? Why?

Middle Elementary

James E. Smith
Gary Sample
Gussie Hawkins

Lunch Room Substitutes

In the elementary schools, the hot lunch program has brought about many changes. Since the schools were not built with cafeterias, auditorium and physical education facilities have been used for food service.

1. Skill areas to be developed:

   a. The ability to listen with comprehension.
   b. The ability to recognize useful data.
   c. The ability to collect data.
   d. The ability to analyze data.
   e. The ability to organize data.
   f. The ability to draw conclusions.

2. Time involved: At least five class periods.

3. Material needed: paper, pen or pencil, cleaning tools.

4. Recommended procedure:

   a. The class lists problems to be solved involving cleanliness of P.E. - Lunchroom area.

   b. Have students discuss the most important problems in this area.

   c. Divide class into groups to discuss what they can do to help solve the problems.

      1. Proper disposal of garbage.
      2. Spillage.
      3. Plan ways to use lunch materials in class projects.
         (Ex. Foil tops for language lessons.
         Plastic ware for art.
         Straws for math counters.
      4. Student attitude towards lunchroom behavior and general control.

   d. Suggest to teachers that all classes make this a unit topic.

   e. Have students view cafeteria after lunch to see what it looks like.

6. Discussion questions to be developed according to age or grade level.

Middle Elementary Gary R. Samples

Earning Money

1. Skill areas to be developed:

   a. The ability to listen with comprehension.
   b. The ability to recognize a problem.
   c. The ability to define a problem.
   d. The ability to organize data.
   e. The ability to analyze data.
   f. The ability to develop a plan of action.
   g. The ability to implement a plan of action.

2. Time involved: 20-30 minutes.

3. Material needed: Four information cards.

   a. Card #1

      YOU MAY NOT SHOW THIS CARD TO ANYONE IN YOUR GROUP. YOU MAY READ THE INFORMATION ON THE CARD TO ANYONE IN YOUR GROUP.

      We need some way to earn money for our class project. How can we do it?

      1. Recycled glass sells for about half of what paper does.
      2. There are 38,400 aluminum cans in a ton.
         Some of the information provided may not be needed.

   b. Card #2

      YOU MAY NOT SHOW THIS CARD TO ANYONE IN YOUR GROUP. YOU MAY READ THE INFORMATION ON THE CARD TO ANYONE IN YOUR GROUP.

      1. Maybe our parents will give us the money.
      2. Glass is too dangerous to handle.
      3. Every ton of paper we collect will save 17 full-grown trees.
         Some of the information provided may not be needed.

   c. Card #4

      YOU MAY NOT SHOW THIS CARD TO ANYONE IN YOUR GROUP. YOU MAY READ THE INFORMATION ON THE CARD TO ANYONE IN YOUR GROUP.

      1. How about a bake sale?
      2. Aluminum sells for $300 a ton, but paper only sells for about $40.00 a ton.
      3. Paper and aluminum are things we can safely handle.
         Some of the information provided may not be needed.

d. Card #4

YOU MAY NOT SHOW THIS CARD TO ANYONE IN YOUR GROUP.
YOU MAY READ THE INFORMATION ON THE CARD TO ANYONE IN YOUR GROUP.

1. We could recycle something like paper, aluminum, or glass for cash.
2. A ton is 2000 pounds.
3. Aluminum needs a lot less electrical power when it is recycled.

Some of the information provided may not be needed.

4. Recommended procedure:

a. Form the class into groups of four.

b. Pass out the information cards - one to each member of the group.

c. Give the following directions:

1. One member in each of the groups has a question to be solved by each group.
2. Participants may not show their card to anyone.
3. Participants may read the information on the card to anyone in their group.
4. Some of the information on the cards is not necessary.

5. Discussion questions:

a. What problems will students have in organizing a drive for paper and aluminum?

b. Where will they get the paper and aluminum?

c. Can they make money with such a project?

d. What community resources can they use to make their drive a success?

e. Will students help the environment at the same time they earn money?

Paper Drive and Recycling

1. Skill area to be developed:

   a. The ability to develop a plan of action

2. Time involved: 6 weeks

3. Personnel needed: Committee composed of:

   a. 2 representatives from each classroom,
   b. 2 Parent Volunteers
   c. 1 representative from the Mother's Club,
   d. 1 representative of the P.T.A.,
   e. Principal.

4. Recommended procedure:

   a. Each classroom will elect 2 class members to represent them at a meeting of the Committee. (Weekly Meetings)

   b. The Principal, a representative from the Mother's Club, the P.T.A. and two Parent volunteers will be invited to a meeting at school.

   c. The elected class members will report the results of each meeting to his or her class. Ask for class ideas.

   d. Possible areas to be explored:

      1. Paper drive for recycling.

      2 Anti-litter posters made by the school children could be placed in the corridors.

      3. Each child could volunteer to keep an elderly couple's yard litter-free.

Middle Elementary

Charliemae Rose
Bill Werick
Leslie Green

Togetherness

1. Skill area to be developed:

   a. The ability to develop a plan of action.

2. Time needed: Approximately 1 week (1 project per day for 45 minutes)

3. Materials needed:

   a. Roll of narrow shelf paper
   b. Short stick
   c. Crayons
   d. Board
   e. Ball
   f. Bell
   g. Candy recipe
   h. Blocks (several for each child)

4. Recommended Procedure:

   a. Classroom Movie

      (1). This will be a classroom movie which tells the story of littering the school yard. On the narrow shelf paper, draw pictures one under the other beginning with one student dropping one piece of litter, in subsequent pictures add more litter per student. Write short captions under the pictures. Fasten each end of the paper to a short stick.

      (2). Show the "movies" to each class.

   b. Dialogue

      (1). Have two children hold the ends of a board and balance a ball resting on the board. Have them walk from one side of the room to the other, keeping the ball in balance. If the children work together cooperatively, the ball will remain balanced.

      (2) Demonstrate this dialogue in each classroom. Then discuss cooperating to keep the lawn free of litter.

   c. Role Play

      (1). Mock Fire Drill

      Choose eight to ten of the less vigorous students and and have them role play a fire drill in which everyone pushes and rushes to get to the door first.

Then allow eight or ten other students to role play the correct way to conduct a fire drill.

(2). Have students discuss why it is important to have groups work cooperatively together.

d. Candy-making

(1). Do this actual procedure in the classroom. This allows the students to see that ordinary everyday activities often involve cooperation. Cooperation is necessary in two ways: obtaining the ingredients and following directions.

e. Dialogue

(1). Give each child several blocks and ask the class to cooperate to build a balanced structure. Have the children take turns adding blocks. After each child has had a turn to add a block, ask what would happen if someone removed one of the blocks. Point out that the removal of almost any one of the blocks would cause the structure to become unbalanced. Thus the blocks are in a way cooperating.

(2). Equate this dialogue with keeping the lawn litter-free.

5. Discussion Questions:

a. What are some things your parents, brothers, sisters, teachers, classmates, and friends can accomplish through cooperation?

b. How do you think you can help in this project? Why?

c. How do you feel when you cooperate with others?

d. Cooperation is fun because . . . .

e. Tell some other ways that cooperation could help improve our environment in the classroom, in the school, and at home.

Section III

Values Clarification Activities

101/102

SECTION III

VALUES CLARIFICATION ACTIVITIES

Children and youth of today are confronted by many more choices than in previous generations and will soon be required to make many more environmental decisions affecting their community, nation and world.

The complexity of our times and of environmental decisions has made the act of choosing exceedingly difficult. Ideally, choices are made on the basis of one's underlying values; however, frequently persons (especially young people) are not clear about their own values.

The Values Clarification Process is concerned with trying to help atudents to become more aware of their own beliefs, attitudes and values; to consider and weigh the pros and cons and consequences of various alternatives; to consider whether their actions match their stated beliefs and if not, how to bring the two into closer harmony; and finally, to try to give students options, in and out of class, for it is only when students begin to make their own choices and evaluate the actual consequences, do they develop their own set of values.

The following are sample Values Clarification strategies that teachers have found helpful in assisting students to clarify their values regarding environmental issues. Though some strategies are recommended as being more appropriate for particular age groups, feel free to change and adapt them for your own uses.

As you become more familiar and comfortable with using the Values Clarification process, you will find that it can easily be included into any kind of teaching unit.

Name Card

1. Time involved: five - ten minutes.

2. Materials needed:

   a. 3 x 5 notecards, one per person.

   b. Pen or pencil.

3. Recommended procedure.

   a. Have participants write their name in center of the card.

   b. Have participants write in the four corners the following information:

      1. Upper left - list 3 things you really value.

      2. Lower left - list 3 figures (alive or dead) that you really admire.

      3. Upper right - list 3 things that you would like to be remembered for after you die.

      4. Lower right - what do you feel are the 3 most serious environmental problems.

   c. Have participants break into groups of 3 and discuss one corner of their cards.

   d. After 2 or 3 minutes, rotate people to other groups, have them then discuss another corner of their cards.

4. Debriefing:

   a. Name Card is a mixer-type activity, used to get participants acquainted.

   b. Helps participants publicly affirm their values.

5. References:

Simon, Sidney, Leland Louse and Howard Kirschenbaum. Values Clarification: A Handbook of Practical Strategies for Teachers and Students. New York. Hart Publishing Co., 1972.

Voting Questions

1. Time involved: 10-30 minutes.

2. Materials needed: none

3. Recommended procedure:

   a. The teacher reads aloud each question by asking "Are you someone who....?"

   b. After each question is read the students take a position by a show of hands: *

      1. Those who strongly agree raise the hand high.
      2. Those who agree raise their hand slightly.
      3. Those who disagree lower their hand slightly.
      4. Those who strongly disagree lower the hand fully.

   c. Discussion can follow either each question or after several questions.

   d. This activity can also be written down on a worksheet.

4. Sample valuing questions: Examples for Lower and Middle Elementary grades. Are you someone who:

   a. Would like to live on a farm?*
   b. Likes to go on long car trips?*
   c. Would like to live in a different city someday?*
   d. Thinks you will smoke cigarettes someday?*
   e. Has a private place to go when you want to be alone?*
   f. Would like to plant something and watch it grow?

   Examples for Upper Elementary - Junior High grades. Are you someone who:

   g. Could live happily without electricity?
   h. Could enjoy living in a rural setting?
   i. Would go to school if you didn't have to?*
   j. Would like to change something about this school?*
   k. Would like to live in another country?*
   l. Would ask your parents or someone else you care about to stop smoking?*
   m. Likes to walk or ride a bicycle to a place rather than be driven?
   n. Would like to ride a motorcycle?*

Examples for Secondary Grades. Are you some one who:

o. Would buy only returnable bottles if both returnable and nonreturnable bottles were present in a store?

p. Feels modern technology will enable man to continue to to enjoy the present standards of living for many decades to come?

q. Feels as long as we have to go through democratic processes to make changes, there is no chance of our moving fast enough to save the environment?

r. Feels that the population problem has a powerful magnifying effect on all our environmental problems?

s. Would prepare your glass, cans and paper for recycling if it were available?

t. Thinks that we should have spent all that money to go to the moon?*

u. Would like to own a snowmobile?

v. Uses a spray deodorant?

5. Debriefing:

a. Voting questions call for public affirmation of one's values.

b. Discussion is very important. You can discuss male and female differences.

c. Example debriefing for spray deodorant issue: The first spray deodorant came out 12 (?) years ago. Now 90% of the population uses spray deodorant. How could we change schools or the race issue as quickly?

d. Just ask each question and go on unless students want to discuss.

6. References:

Simon, Sidney, Leland Howe and Howard Kirschenbaum. Values Clarification A Handbook of Practical Strategies for Teachers and Students. New York: Hart Publishing Co., 1972.

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* Procedure 3b and Sample valuing questions a,b,c,d,e,i,j,k,l,n and t have been reprinted by permission of Hart Publishing Company, Inc., from its copyrighted volume VALUES CLARIFICATION: A Handbook of Practical Strategies for Teachers and Students by Sidney B. Simon, Leland W. Howe and Howard Kirschenbaum.

All Grade Levels

Glen Erickson

Rank Order

1. Time Involved: 10-20 minutes

2. Materials Needed:

   a. pencil and paper

   b. blackboard

3. Recommended Procedure:

   a. Explain to class that you will be reading some questions to them, which they will rank order according to their own value perspective. Each question will consist of 3 or 4 alternative choices.

   b. Read a question, and write the alternative responses on the board.

   c. Have the students write down their rank orders (1 for first choice, 2 for second choice, etc.) for that question on a piece of paper.

   d. After everyone has completed their rank ordering for the first question, allow several students to share out their rank orders and their reasons with the class.

   e. Continue this same procedure for all the questions you wish to use.

4. Sample Valuing Questions:

   a.* Which would you least like to be?

      1. Deaf
      2. Blind
      3. Paralyzed from waist down

   b. Would you rather be a

      1. Flower
      2. Tree
      3. Boulder

   c.* Where would you rather be on a Saturday afternoon?

      1. At the beach
      2. In the woods
      3. In a discount store

d.* Which is most important in a friendship?

1. Loyalty
2. Generosity
3. Honesty

e.* Where would you rather live?

1. On a farm
2. In the suburbs
3. In an inner city

f. Which is the least important to you?

1. A horse
2. A dog
3. A deer

g. How many children would you like to have?

1. 0
2. 1
3. 3

h.* What would it be hardest for you to be?

1. A prison guard
2. A welfare inspector
3. An assembly line worker

i. What is the most serious problem facing society today?

1. Education
2. Pollution
3. Racism

j. Rank the following environmental problems in order of their critical nature.

1. Energy
2. Air and water pollution
3. Housing

k.* Which pet would you rather have?

1. A cat
2. A dog
3. A parakeet
4. A turtle

l.* If you were President, which would you give the highest priority?

1. Space program

2. Poverty program
3. Defense program

m. Which method of transportation do you like the most?

1. Riding in a car
2. Riding a bicycle
3. Walking
4. Flying on an airplane

n.* Which do you like best?

1. Ice cream
2. Pudding
3. Jello

o.* Which would you like to do most?

1. Learn to skin dive
2. Learn to ride a horse
3. Learn to ride a mini-bike

p. Which do we need to train more of? Each group to be ranked separately.

Group I	Group II
Lawyers	Skilled Labor
Doctors	Professional
Teachers	Management

q. Which would you rather own?

1. A motorcycle
2. A backpack
3. A TV set

r. You are hiring for a sales position in a chain store. You have three applicants. Which one would you choose?

1. An exconvict
2. Unmarried pregnant female
3. A released mental patient

s. The largest industry (employer) in town is destroying the main river. What action?

1. Arson (violent protest)
2. Boycotting
3. Petitioning city hall

t. What is the most influential factor of social change?

1. Family
2. Peer group
3. Governmental laws

u. You witness a mugging. Which action would you take?

1. Direct assistance
2. Call police
3. Ignore

v. Have the class make up own rank orders.

5. Debriefing:

a. Publicly affirming one's values helps in clarifying those values.

b. No order is right or wrong

c. Sharing out students' reasons for their rank orders helps other students clarify their own values by listening to other alternative rankings, along with the students' reasons.

d. Helps students understand that many issues require more careful consideration than we normally give them.

e. Helps demonstrate that to make a decision about an issue requires one to make a choice.

6. Reference:

Simon, Sidney; Leland Howe and Howard Kirschenbaum.

Values Clarification: A Handbook of Practical Strategies for Teachers and Students. New York, Hart Publishing Co., 1972.

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* The Sample Valuing Questions e,d,e,k,l,o,n and part of a and h have been reprinted by permission of Hart Publishing Company, Inc., from its copyrighted volume VALUES CLARIFICATION: A Handbook of Practical Strategies for Teachers and Students by Sidney B. Simon, Leland W. Howe and Howard Kirschenbaum.

Either-or Forced Choice

1. Time involved: 45-50 minutes.

2. Materials needed:

   a. Two blackboards or large pieces of paper.
   b. Can also be done with two slide projectors and appropriate slides.

3. Recommended procedure:

   a. Have students arrange their desks/chairs so that there is a wide path from one side of the room to the other.*
   b. Place blackboards on opposite sides of the room.
   c. Place an either-or question on the blackboards; and ask
      Example: Which do you identify with more
      1. The Four Tops
      2. The Jackson Five
   d. Explain to the students that they are to select one of alternatives and move to that side of the room where it is posted.
   e. Have students form triads to explain briefly why they decided on this choice. Allow 2 minutes per student.
   f. After the 2 minute triads session have students return to the center of the room and ask another either-or question.
   g. Select a student from each opposing views and have them relate to the entire group why they made their particular choice.
   h. This exercise has an unlimited range of alternative questions to ask.

4. Sample of Either-or Forced Choice Questions. 'Which do you identify with more:"

   a. Asphalt or grass
   b. Clean air or dirty air
   c. Noisy neighborhood or quiet neighborhood
   d. A clean playground or a littered playground.
   e. Love and understanding or hatred and distrust
   f. New housing or old housing.
   g. Equal rights or no rights
   h. Trees or telephone poles
   i. Expressways or bike routes
   j. Urban community or suburban community
   k. Strip mining or solar energy
   l. Nuclear power plants or steam power plants
   m. Urban farming or high prices
   n. Cooperative living or independent living
   o. Have group suggest other Either-or questions.

5. Debriefing

   a. Note the importance of having individual differences and the free-

dom to evaluate all possible alternatives to an issue or situation.

b. Participants can physically see how their values relate to the values of the group members.
c. No position or alternative is right or wrong.
d. Sharing out reasons for individual choice among group members is important in clarifying individual position.
e. Any two contrasting value statements can be used that apply to the group.

6. References:

Simon, Sidney. Leland, Howe, and Kirschenbaum. Values Clarification: A Handbook of Practical Strategies for Teachers and Students. New York: Hart Publishing Co., 1972.

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Physical Continuum

1. Time involved: 10 - 20 minutes.

2. Materials needed.

   a. Two blackboards or large pieces of paper.
   b. Can also be done with two projectors and appropriate slides.

3. Recommended Procedures:

   a. Place blackboards on opposite sides of room.

   b. Clear area between blackboards.

   c. Write pairs of issues on boards.

      Example City (on one board) - Country (on other board).

   d. Explain to group the choices involved, noting that choices exist from one board to the other board.

   e. Have participants place themselves along the imaginary line between the two boards which have opposite values listed on them.

   f. It is best if you eliminate the possibility of someone standing half-way between boards, so participants must make a choice.

   g. After people have aligned themselves, have them discuss amongst those adjacent to them, their reasons for placing themselves where they did along the physical continuum.

   h. Have people readjust their position, with respect to those people nearest them, to more accurately associate their position on the continuum with their personal value.

   i. Select individuals to relate to the group their reasons for their physical position on the continuum.

   j. Go on to next pair of values and repeat procedure.

4. Sample valuing questions:

   a. City - Country

      Which place would you rather live in?
      Which place would you rather work in?

b. Powerboat - sailboat

Which would you rather own? (both items identical in price.)

c. Snowmobile - cross country skiing.

Which would rather do?

d. Have group suggest other contrasting value statements.

5. Debriefing:

a. Note the importance of people, physcially and publicly affirming their values to better clarify them.

b. Participants can physcially see how their values relate to the values of other group members.

c. No position is right or wrong.

d. Sharing out reasons for individual positions among group members important in clarifying individual positions.

e. Any two contrasting value statements can be used that apply to the group.

6. References:

Simon, Sidney; Leland Howe and Howard Kirschenbaum. Values Clarification: A Handbook of Practical Strategies for Teachers and Students. New York, Hart Publishing Co., 1972.

All Grade Levels — Glen Erickson

Twenty Questions

1. Time Involved: 15 minutes

2. Materials Needed

   a. pencil and paper

   b. blackboard

3. Recommended Procedures

   a. Ask the students to write on a piece of paper the number 1-20.

   b. Now have them list twenty things they enjoy to do.

   c. Have students evaluate their list according to the code explained in Debriefing.

4. Sample Valuing Questions:

   a. These can be "big" things in life, or "little" things. *

   b. The students might want to think in terms of the seasons of the year.*

5. Debriefing:

   a. Put the following code on the blackboard for the students to use in evaluating their 20 things.

      $ -- anything that costs over $20 to do
      S -- things you learned in school
      P -- things that pollute or degrade the environment
      N -- things you do in the natural environment
      A -- things you do alone
      Pa-- things you do or did with your parents
      5y-- things you didn't do five years ago
      R -- things that involve risk
      F -- things that you do with your friends

   b. Several code items may be used for each of the twenty things.

   c. The code provides a way to evaluate the types of things you like to do.

d. The code also gives you an idea of the trends you are following in doing enjoyable things.

e. It is a good idea to do this activity at different times in the year to show the students how they might have changed during the year.

f. Declaring the things you enjoy doing provides you with a way of identifying and clarifying what you enjoy.

6. References:

Simon, Sidney; Leland Howe and Howard Kirschenbaum

Values Clarification: A Handbook of Practical Strategies for Teachers and Students. New York, Hart Publishing Co., 1972.

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* Sample Valuing Questions a and b in #4 have been reprinted by permission of Hart Publishing Company, Inc., from its copyrighted volume VALUES CLARIFICATION: A Handbook of Practical Strategies for Teachers and Students by Sidney B. Simon, Leland W. Howe and Howard Kirschenbaum.

Public Interview

1. Time involved: 5-10 minutes per interview.

2. Materials needed: none.

3. Recommended procedure:

   a. Ask for volunteers who would permit a public interview about some of their personal beliefs, feelings and actions.
   b. Explain ground rules several times as to safeguard the students personal feelings.
      (1) The teacher may ask any question about any aspect of his or her life and values.*
      (2) If student decides to answer question, she or he must answer honestly.
      (3) The student has the option to decline to answer question.
      (4) The student can end the interview at any time by simply saying "Thank you for the interview".*
      (5) At the completion of the interview the student may pose any of the same questions to the teacher that were put to him or her.
   c. Each interview should be brief. About 5-10 minutes, unless there is a demand by everyone to continue.
   d. You may want to invite other members of the class to answer any of the questions the interviewee was asked.
   e. After some practice at public interviewing you may want the students to choose the topic they want to be interviewed about.
   f. Instead of conducting the interview, you may want to select a student to conduct the interview. It is important to debrief student on ground rules before allowing any interviewing.

4. Sample interview questions: Lower and Middle Elementary grades.

   a. Do you get an allowance? What kind? Do you work for it?*
   b. If you could be any age, what age would you like to be?*
   c. Will you be a cigarette smoker? Why?*
   d. What about the world around do you wonder about?
   e. Do you think people should be allowed to live anywhere they want to?
   f. What are your feelings about people of other races and cultures?
   g. Do you like living in the neighborhood you are presently living in? Why?
   h. Would you want to live in an area where the air was unclean? Why or why not?
   i. Do you like flowers and trees? Why?

   Examples for Upper Elementary - Junior High grades.

   a. What are your feelings about poverty?
   b. Do you feel comfortable about living in the city?
   c. What are the major problems facing young people today?

d. What is your opinion on public welfare?
e. Is there anything special about family meals at home?
f. How do you feel about man's exploitation of our valuable natural resources?
g. What are some of the reasons for environmental pollution in this country?

Examples for Senior High school.

a. Should your school provide classes dealing with population education?
b. What are your views about racism and sexism in your school? Home? Neighborhood?
c. Do you feel that large energy corporations should be allowed to strip mine for coal on Indian lands? Why? Why not?
d. Do you feel communities should have control of their tax monies which they contribute yearly to the state and federal governments?
e. How important is it to the survival of space ship earth and its passengers to maintain a clean environment?
f. Are there some adults outside of school whom you admire intensely? Why?
g. What are your feelings about a world with universial peace?
h. What has turned you off to school? Why?
i. What are some ways students can contribute to their own education?

5. Debriefing:

a. Discussion is very important. You can compare and contrast male and female responses.
b. Sharing out reasons for individual positions or values is a good way of developing good interpersonal relationships among group members.

6. References:

Simon, Sidney, Leland Howe, and Kirschenbaum. Values Clarification: A Handbook of Practical Strategies for Teachers and Students. New York: Hart Publishing Co., 1972.

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* The Recommended Procedure in 3b (1) and (4) and the Sample Interview Questions in 4a,b,c have been reprinted by permission of Hart Publishing Company, Inc., from its copyrighted volume VALUES CLARIFICATION: A Handbook of Practical Strategies for Teachers and Students by Sidney B. Simon, Leland W. Howe and Howard Kirschenbaum.

All Grade Levels

Talbert B. Spence

The Pie of Life

1. Time involved: 45 - 50 minutes

2. Materials needed:

   a. Blackboard or chart paper

   b. Worksheets (for Upper Elementary, Junior High, Senior High) with drawing of a large circle to be used in diagraming a "pie of life" (see example in 3g).

3. Recommended procedure:

   a. Explain to students that this activity is designed to have them investigate our individual lives - to see how we actually do spend our time, our money, etc.*

   b. Group class into teams of 4-5 students. Explain that these teams are for the purpose of having individual and group decisions on how our time, money, etc. can be used more efficiently.

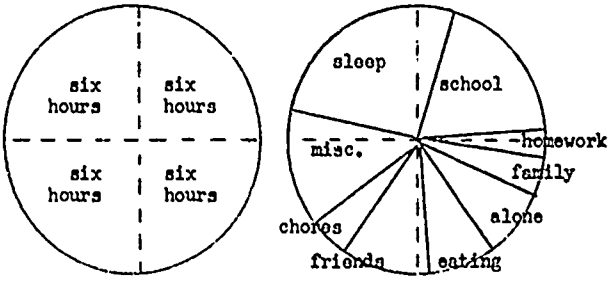
   c. Ground rules: Teacher draws on blackboard/chartpaper or on worksheets a large circle and says, "This circle represents a part of your life".* Explain that the group will be doing several such pies of life.

   d. Have students divide their circles into four quarters using dotted lines. Note: For lower elementary and middle elementary this portion of the activity should be done by the teacher at the blackboard.

   e. Explain that each slice represents six hours. Discuss with groups that they are now going to try to estimate how many hours or parts of an hour are spent on the following:

      (1). On sleep?*
      (2). On school?*
      (3). On eating?
      (4). With friends, socializing, playing sports, etc.?*
      (5). Alone, playing, reading, etc.?*
      (6). On homework?*
      (7). Etc. (Any others you can think of)?

f. Have students divide up the time spent in their individual pies of life. Explain that their allotted times will differ from one another. Have them draw slices in their pies to represent proportionately the part of the day they spend on each category. An example might be:



g. After students have completed individual pies (about 10-15 minutes) have the group work toward a group pie of life with the same categories. Have students take about 10 minutes to do this and then have groups share out their results to the rest of the teams.

h. Discuss the importance of using time wisely and efficiently. Emphasize that a large majority of our time spent in a 24 hour period is wasted time; most by sleeping (a reasonable amount is needed) and by doing nothing.

i. Have students develop a list of ways to use their time, money, etc. more wisely and efficiently.

j. Examples of other categories that could be used in the Pie of Life strategy:

(1). How does society spend its money?

(2). How much time is spent on cleaning up the environment?

(3). How much money is spent on cleaning up the environment?

(4). How much time is spent by people destroying the environment?

(5). How much time is given to students to plan and make decisions?

(6). How do urban children spend their time daily?

4. Debriefing:

   a. It is important that students start to evaluate how their time and money are spent by them and by others. Also to think about and develop ways of better utilization of their time and money, etc.

   b. Might be a way to discuss alternative life styles, also a way to clarify individual and societal values on time and money.

   c. For lower and middle elementary levels, this strategy could be a way of strengthening knowledge and skills of telling time and understanding what it is all about.

5. References:

   a. Simon, Sidney: Leland Howe and Howard Kirschenbaum. Values Clarification: A Handbook of Practical Strategies for Teachers and Students. New York: Hart Publishing Co., 1972.

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Middle Elementary
(Water Quality)

Oak Park Schools

Swapping Drips and Drops

1. Time Involved: One to two weeks

2. Materials Needed: Water chart

3. Recommended Procedure:

   a. Post a water chart in the classroom. The chart will include every student's name and the days of the week.

   b. Each child is allowed a limited amount of water during the week. Have the class decide the amount of water to be consumed. Post this quota on the chart.

   c. When each child uses up his quota, he gets no more.

   d. Students can decide what the different use of water is worth. For example; they may consider that 3 hard washes are equal to one drink of water.

4. Valuing Activities:

   a. Rank order the uses of water from most important to least important uses:

      Hand washing
      Drinking water
      Water to wash chalkboard
      Flushing toilet
      Water to mix paint
      Water for cleaning up room
      etc.

   b. Complete open ended sentences, such as:

      I discovered that....

5. Debriefing:

   a. If you had to do this activity again would you change your use of the water supply?

   b. Were you surprised at how much water you actually used?

   c. How did you feel when you ran out? Do you feel that you use water wisely?

6. References:

   a. Sidney B. Simon, Leland W. Howe, Howard Kirschenbaum, Values Clarification: A Handbook of Practical Strategies for Teachers and Students, Hart Publishing Co., Inc., 1972.

Section IV

Middle Elementary Environmental Encounters

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SECTION IV

Environmental Encounters

This section contains a series of sample school-community environmental problem solving activities (Environmental Encounters). In these environmental encounters students (with guidance from the teachers) actively become involved in exploring and critically evaluating their environment and existing environmental problems. The students may then begin to develop alternatives and plans of action for solving environmental problems. As students become actively involved in environmental problem solving they gain the opportunity to acquire both knowledge and skills necessary to deal with current and future environmental problems.

Included are sample environmental encounters relating to all grade levels and disciplines starting with early elementary encounters, which concentrate mainly on developing a basic awareness and appreciation for the environment, and ending with senior high encounters, in which students may actually become involved in the political process in trying to implement the designed plans of environmental action.

You may find it helpful to adapt some of the sample encounters for use in your particular classes. However, you will probably find that the "best" environmental encounters are ones jointly developed with your students around their environmental interest and concerns.

Environmental encounters are included for each of the five grade levels. Within each level there are sample encounters for the following topics:

1. Ecology and Pesticides
2. Water Quality
3. Air Pollution

4. Recreation

5. Policy and Planning (soils, land use, planning, and environmental law)

6. School Site Development

7. Transportation

The encounters represent a wide diversity, so that some are applicable to inner city, and some to suburban and rural situations.

Middle Elementary
Air Pollution

Emily Klopfenstein

A STUDY OF AIR POLLUTION CAUSED BY AUTOMOBILES

BEHAVIORAL OBJECTIVES:

At the completion of a successful encounter the student should be able to:

1. Identify (number) effects of air pollution.
2. List (number) reasons why the automobile is the greatest cause of air pollution.
3. Gather a sample of auto air pollutants from a car tailpipe.
4. Name (number) ways the automotive air pollution problem can be eased.
5. Plan a campaign to combat automobile air pollution.
6. Carry out the campaign.

ACTIVITIES:

1. List on a chart air pollution problems. Which directly affect man? Which affect non-living things? What are the sources of air pollution?
2. Is the internal combustion engine efficient in burning its fuel? What is the most widely used form of transportation today? Has there been much control on the automobile concerning its use and upkeep?
3. Have each student perform an experiment with their family car. Each student should cover the tailpipe with gauze for one day and bring in the cloth. Describe the cloth. What is the blackish color due to? Survey the class and divide it into groups whose family car was driven 1-5 miles, 5-12 miles, 12-20 miles, and over 20 miles in one day. Which group has the darkest cloth? Is there anyone in the first group with a dark cloth? What might this tell you about their car? What is the dangerous colorless, odorless gas the automobile is known to emit? Does exhaust have a pleasant smell?
4. Seek information on the use of lead free gas. How would the efficient use of diesel fuel in a diesel engine ease pollution? Seek information on the turbine engine. Will it be necessary to revert to the electric or steam vehicle? Why were these engines abandoned? Seek information on automobile air pollution control devices. Discuss how they recycle th exhaust for more efficient burning. How can the individual help ease the problem? Can we hike or bicycle more? Should we let the cars'

engine idle while it's standing? Can we drive more efficiently avoiding rapid acceleration and braking (which causes attrition pollution)? How would keeping the car in good repair and tuned up aid in pollution control? Can we arrange to share rides? Why should we support mass transit? What legislation is needed for industry to install the best pollution control devices and manufacture cars which won't break down when the car is new. What aid is needed for research in this area? What legislation is needed to force citizens to keep their car in good repair? What aid is needed for research on the use of other fuels?

5. Which problems could be listed on a survey for each student to conduct with his family? List the questions to see if one's family practices good habits to help ease air pollution from their automobiles. Does your car have a pollution control device? Does your family hike or bicycle when possible? Do you let the car's engine idle while it's standing? Do you arrange sharing rides when possible? Do you use mass transit when possible? Do you keep up an interest in what legislation is needed?

6. Make a poster presentation of automotive air pollution problems. Put one problem on each poster and display them in school, community, etc.

7. Carry out an automobile anti-pollution campaign through posters and a survey of neighborhood to assess car upkeep, etc. Correct any negative answers within the family. One could expand survey to the community with help from other classes and suggest how one could correct their contributions to air pollution. Check with the State Police to see if it would be possible to conduct the survey with their auto safety check when it's carried out locally. Also, ask to display the posters at this time.

Middle Elementary
Air Pollution

Dorothy Cox

AN INVESTIGATION OF COMMUNITY AIR POLLUTION

BEHAVIORAL OBJECTIVES:

At the conclusion of a successful encounter, the student should be able to:

1. List in writing (number) sources of air pollution at your school.
2. List in writing (number) sources of air pollution in your community.
3. Describe in writing (number) problems air pollution in your community can cause.
4. Describe in writing (number) solutions for one problem noted in #3.
5. Describe (number) ways you can help to reduce air pollution in your community.
6. List the steps for building and maintaining a compost heap.

ACTIVITIES:

1. Investigate sources of air pollution in the school building. Is there excessive use of chalk and chalk dust in the classroom? How does this affect people? Use vaseline coated paper or vaseline in cups to collect dust in the room.
2. Investigate parking lot, for another source of air pollution. Count cars. Fasten a clean white cloth over exhaust pipe of a car and run motor for (number) minutes. Remove cloth and note residue and color. What about gases that cannot be seen? When a car is allowed to run while standing still, does it add unnecessary pollution? What can we do to remind adults of good habits?
3. Visit the school incinerator after lunch. What is being burned? Does it burn completely? Note smoke and particulate matter coming from chimney. What color is the smoke? Is this desirable? What harm can it do to people? plants? Do you think this is a problem at our school? Would it be a problem with twice as many students?
4. What alternatives are there to burning trash? Who would make the decision? Interview Principal. Are there any alternatives considered?

5. Survey class members to determine:

   a. What kind of heat is used at your house? coal? oil? gas?

   b. Do you burn trash?

   c. Do you have a compost heap?

   d. Do you save paper for recycling?

   e. Did you burn leaves last fall?

   Tabulate and discuss frequency of good environmental practices.

6. Set up a sample compost heap in an aquarium tank using:

   4"..... {dead weeds, grasses, and leaves
   {discarded food from lunch room
   lime
   top soil
   Saran for cover
   1"..... meat thermometer to record internal temperature

   (See attached resource paper "Compost to Fight Air Pollution")
   Observe temperature variance and changes taking place over a period of time.

7. What can class members do to reduce air pollution at our school and at home? Discuss plan of action and implement.

   (Suggestions:

   a. a school compost heap

   b. posters

   c. inform parents via school newspaper article and/or information sheet.)

Middle Elementary
Ecology and Pesticides

Dorothy Cox

NATURAL HABITATS IN OUR COMMUNITY

BEHAVIORAL OBJECTIVES:

At the conclusion of a successful encounter, the student should be able to:

1. List (number) different types of habitats within walking distance of your school.
2. Draw a picture of (number) living things that live in one habitat listed in #1.
3. Draw a picture of (number) food chains (or web) in the habitat chosen in #2.
4. Describe orally (number) ways people can change each habitat you listed.

ACTIVITY:

1. Visit playground of the school. On a grassy area, mark off with string (number) plots one yard square. Choose sites in sun and sites in shade if possible. Teams of students will observe:
   a. How many different kinds of plants?
   b. How many different kinds of insects?
   c. Any evidence of animal life?
   d. Is ground moist or dry? In sun or shade?
   e. Record above data, collect sample specimens, or sketch specimen types.
2. Visit nearby field area (vacant lot, etc. where no mowing occurs). Repeat procedure outlined in #1.
3. Visit nearby wooded area. Repeat procedure outlines in #1.
4. Visit a nearby swampy area. Repeat procedure outlined in #1.
5. Visit a nearby pond or stream. Mark off sections of bank one yard long. Collect data as outlined in #1. Collect sample of water and stream bottom "gunk." Alter density of sample water by adding salt or sugar. When animal life floats to top, count varieties.
6. Upon return to class room with data and specimens, discuss similarities and differences. Work out a food chain (or web) for each area studied. Organize data and specimens into displays and/or dioramas. (Have Field Guide resource books available for those students who wish to look up specific names of specimens.)

7. Discuss "people" activities that would disrupt each habitat. What would happen to plant and animal life:

   a. If someone decided to put in swings on the part of the playground where you were making your observations?

   b. If the field became a part of the playground and was regularly mowed?

   c. If, in the woods, someone decided to cut down trees, clear out bushes, and build a house?

   d. If someone decided to put the stream or river underground so they could build a road or level a yard?

   f. (Elicit other possible, typical disruptions from students.)

8. Discuss: Should people investigate more than one place or one way to conduct their activities? Should people think of nature too?

Worksheet — NATURAL HABITATS IN OUR COMMUNITY

	PLAYGROUND	FIELD	WOODS	SWAMP	STREAM
PLANTS					
INSECTS					
ANIMALS					
CIRCLE 2	moist dry sun shade	moist dry sun shade	moist dry sun shade	moist dry sun shade	moist dry sun shade
SKETCHES					

Middle Elementary
Ecology and Pesticides

Ian Smith

INVESTIGATING MAN'S ROLE IN THE ECOSYSTEM

BEHAVIORAL OBJECTIVES:

At the completion of successful encounter, the student should be able to:

1. Define the concepts of ecology and ecosystems.
2. Draw a sample ecosystem composed of components that can be found around the school.
3. Draw a food chain which includes man.
4. List (number) substances found at home which could alter the environment.
5. Identify how each of the above mentioned substances alters the existing ecosystem in which it is used.
6. List (number) existing state or federal regulations that govern the use of each of the substances.
7. Develop a plan which would lead to the discontinuation of use of selected substances.

ACTIVITIES:

1. Research and discuss the concepts of ecology:
   a. What is a food chain?
   b. What is an ecosystem?
   c. How are things inter-dependent?
   d. What is included in an ecosystem?
2. Take a tour of the school site as an ecosystem. The students then should draw the ecosystem of the site and the food chain which can be found on the site.
3. Have the school nurse or cook present a talk on what makes up a good balanced mean. Relate to an ecosystem which includes man as a consumer.
   a. Can you tell where each food comes from?
   b. Where does the food acquire its energy needed for growth?
   c. Do all organisms get their energy directly from the sun?
   d. How does man fit into the food chain (Produces, decomposes, consumes)?

4. Have the children check at home to find what environmentally altering substances they may have (suggestion: fertilizer, washing materials, pesticides, etc.).

5. Discuss with the students the uses of the substances:

   a. What are good points of each?
   b. What are their bad points?
   c. What effect do they have on the ecosystem if used properly?
   d. What effect will they have if used improperly?

6. Write the appropriate state and federal governments:

   a. What laws do we have on the use of each of these environmental altering substances?
   b. Are the laws the same in all states?
   c. What new laws are being made?
   d. What penalties are there when one of the laws is broken?

7. How can you become involved in eliminating some of these substances in order to reduce harmful effects on the environment?

Middle Elementary
Policy and Planning

Ian Smith

INVESTIGATING AN AREA OF LAND

BEHAVIORAL OBJECTIVES:

At the completion of a successful encounter, the student should be able to:

1. Write a history of the land area in question.
2. Identify the present use of the land.
3. Describe in writing the zoning regulations for this land.
4. Draw a simple topographic map of the area including identification physical and natural features.
5. Draw a soil profile of the land.
6. List (number) of owners and/or controllers of land in question.
7. List 4 alternate uses of the land.
8. Draw 2 plans showing 2 of the 4 alternate plans listed in number 7.
9. Present plans to the committee which controls planning of the land.

ACTIVITIES:

1. Take a tour of the land noticing:
   a. What is the present land use?
   b. What are the geological features?
   c. What are the artificial features?
   d. What type of terrain is this?
   e. Can you suggest some possible uses?
2. Write to the state highway department requesting topographical maps of the area.
   Have students draw on these maps the location of existing features (buildings, streets, plant life).
3. Visit the city or county library or records offices:
   a. What is the past use of this land?
   b. How is it zoned?
   c. What are the other restrictions on this land?
   d. Who owns and controls this land?

4. Take samples of the soil. What is the soil made up of? What is it good for? What is its profile? Where would you find this out? Can you draw this?

5. What other factors should you considar when surveying a parcel of land?

6. Is the land being used properly according to legal, ecological and geological factors? If not what are some of the alternatives? What would you suggest is the best use?

7. Construct the best alternatives, if any, as a plan and present them to the controllers of the land (check #3 above) as a possible use for this land.

Middle Elementary
Policy and Planning

Emily Klopfenstein

ENFORCEMENT OF A SOLID WASTE DUMPING POLICY

BEHAVIORAL OBJECTIVES:

At the completion of a successful encounter, the student should be able to:

1. Locate an area with an illegal solid waste dumping problem.
2. List in writing (number) reasons why this is a problem.
3. Report and present evidence to local police concerning the dumping problem.
4. Identify and contact other community officials about continued and broader enforcement.
5. Plan an anti-litter campaign.
6. Publicize and assist in carrying out the planned anti-litter campaign.

ACTIVITIES:

1. Take a drive along local country roads and survey areas where solid waste dumping has occurred. Choose a particularly bad dumping area. Take pictures for evidence.
2. Is it fair for individuals to spoil areas particularly those on public property and within public view? What undesirable animals can the dumping of garbage attract? Is such an area safe? Can the area be enjoyed? What happens when an area starts being used as a dump? How costly is the problem? Who pays the price? What does the law say? Are there legal dumping sites available?
3. Contact the local police. Ask for their cooperation. Can they help watch for the violators and gather evidence? Will they arrest them? Can the owners assist? Can the students attempt to catch the violators with a camera?
4. Ask the police to advise what other officials could publicize the effort. Could the newspapers publicize it? Write to one's state senator and state representativa asking for information on other such campaigns.

5. Locate a public area which has a serious litter problem. Photograph this area. Make posters and announcements inviting people living in the immediate area and others to participate in a clean-up campaign. Attach the photographs to the posters. Publicize the use of litter bags in the car. Contact an agency such as AAA to see if litter bags could be distributed. Are waste barrels needed? Could they be provided.

6. Conduct the clean-up and photograph the results. Publicize the results through before and after pictures in the newspapers and on more posters. On the posters remind people to keep the area beautiful. Distribute the litter bags and place barrels in the area if they are provided.

INVESTIGATING RECREATIONAL OPPORTUNITIES OF THE FOURTH GRADE CLASS

BEHAVIORAL OBJECTIVES:

At the completion of a successful encounter, the student should be able to:

1. Define recreation in writing.
2. List (number) types of recreation available in the community.
3. List (number) favorite recreational activities of the class.
4. List (number) recreational activities that are desired but not available in the community.
5. Identify where they could carry out each desired activity.
6. Identify who is responsible for seeing to it that the activities desired are provided.
7. Identify what would be needed to carry out a proposed plan in terms of material and money.
8. Develop a strategy as a group to make one of the most popular recreational activities of the class available to the class.

ACTIVITIES:

1. Define recreation in your own words after thinking over at least two good sources of a definition.
   a. Check with a physical education teacher for a source of a definition.
   b. Check a library source.
   c. Who recreates?
2. What are the classes favorite activities? Which activities cannot be pursued? Why not?
3. Could a strategy be developed to obtain a desired recreational activity not present?
   a. Is there a place to carry it out?
   b. Are there facilities available?
   c. What is needed to make the facilities available?

d. Could someone volunteer adult supervision?

e. Could a fund raising help? How much money needed?

f. Can city or township officials be interviewed to establish whether they could help fulfill recreational experiences? Who are they? How can they help?

4. Develop a strategy to carry out the most popular recreational desires of the class. Make a presentation to the proper authorities the following facts:

a. The number of students that want to be involved.

b. Where it could be done.

c. Sources of supervision.

d. Total cost (include supervision, equipment or rent).

5. Carry out the plan.

6. Evaluate the strategy's effectiveness.

Middle Elementary
Recreation

Emily Klopfenstein

PLANNING IMPROVEMENTS ON AN EXISTING SCHOOLGROUND

BEHAVIORAL OBJECTIVES:

At the completion of a successful encounter, the student should be able to:

1. Inventory existing playground equipment.
2. Analyze in writing the existing equipment listing the benefit of each.
3. Analyze in writing the problems and limitations of the equipment according to the ecology of the playground.
4. List (number) desired recreational pieces of playground equipment to add to the schoolground.
5. Explain in writing why these pieces are desired.
6. Prepare an oral presentation of the alternative choices of equipment.
7. Plan a method for conducting a survey of student opinion.
8. Present the results of the survey to school officials.
9. Implement the school officials response to the presentation and student survey.

ACTIVITIES:

1. List existing playground equipment under one of the three categories:
   a. team sport
   b. specific use of equipment (where several may participate individually but the use of the equipment is specific) such as swings or a slide.
   c. creative equipment such as monkey bars, concrete drain tiles.
2. Beside each piece of equipment list a benefit. Consider these questions: Does this equipment develop team cooperation, coordination, muscles, or creativity? Is the equipment fun?
3. Is the area level or hilly? Does it have good drainage? What is its size? Is some rearranging necessary? Will there be enough room to run freely?

4. Based on the inventory survey and the ecology of the schoolyard, what new equipment would be different or what equipment does the school need more of and what equipment suits the nature of the playground? Look at a recreational catalog for possibilities. Observe budget limitations, if any. Will the new equipment serve a purpose?

5. Identify desired equipment and list why it is needed, and why it would be beneficial.

6. Arrange for an oral presentation of this information to the students of the school. Use slides to illustrate the various types of equipment. Student opinion should be assessed concerning the proposals put forth in the presentation. Should every person be chosen or should representatives from each age group or class be chosen?

7. The survey should be carried out as completely as possible with results written up in such a way as to be the main feature of a presentation to the school officials and P.T.O. Benefits of the plan should demonstrate the planning and ecological considerations that have taken place.

8. If presentation and recommendations are acted upon, students should plan a way to carry out the necessary action then implement it. This might include fund raising, purchasing of desired equipment and actual construction or installation.

Middle Elementary
School Site

Emily Klopfenstein

IMPROVEMENT OF THE MICROCLIMATE ON ONE'S SCHOOL SITE

BEHAVIORAL OBJECTIVES:

At the conclusion of a successful encounter, the student should be able to:

1. Drew a map of the school site.
2. Identify (number) climatic problems on the school site.
3. List possible solutions to each of these problems.
4. Describe the ecological rationale for each solution.
5. Design a plan to solve at least one of these climatic problems on the school site.
6. Carry out the plan for solution of these climatic problems.

ACTIVITIES:

1. After a short field trip around the school site ask the student to answer the following survey questions: From which direction does the wind blow? Are there any trees to reduce the wind? Where are those trees? Is the playground protected from the wind? Which rooms have the greatest exposure to the sun? Are there any trees to shade them? Is the school near a highway? Are there trees or shrubs planted so as to create a barrier against highway noise?
2. Drew a map of the school property. Indicate wind direction with arrows. Indicate existing trees and shrubs with different symbols.
3. Is the wind a problem? Does it cause discomfort? Does it cause the snow to drift in winter? Would a wind barrier save heating and fuel? Are the rooms facing the sun uncomfortable during the day? Is there disturbing noise from the road?
4. What could be planted to break the wind? Where should shade trees be planted? Where should plantings be placed to reduce road noise?
5. Choose the trees and area where they would be planted to reduce wind. Plan the location for shade trees. Plan the location for shade trees. Plan the location for trees to shield highway noise. Using different symbols add the proposed trees and shrubs to the map of the site.

6. Present the plan to school officials, parents and students. List the problems. Describe alternative solutions giving a rationale for each. Volunteer to help organize a school work project to carry out the necessary plantings.

Middle Elementary
School Site

Richard D. Gwinn

INVESTIGATING GROUP ACTIVITIES ON THE PLAY PAD OR ASPHALT AREAS

BEHAVIORAL OBJECTIVES:

At the completion of a successful encounter, the students should be able to.

1. Distinguish orally between conflicts that are caused by natural behavior of students and conflicts that are caused by their environment.
2. State in written form how environmental objects cause or aid the conflicting activities.
3. Draw to scale (1 in. to 10 f.) or (1/2 in. to 10 ft.) the play pad areas, including necessary physical features and the areas of conflicting activities.
4. Discuss verbally what they observed about the conflicts.
5. List two solutions to the conflicts and be able to defend them.
6. Select what they think as a class would be the best solution to the conflict.
7. Carry the best solution out, or see it through to its implementation.

ACTIVITIES:

1. By observation, record details of activities that are taking place before school , during school, after school and in the evening, in the format below:

Nature of Conflict induced by Environment	Nature of Conflict induced by Behavior	Time	Location	Activity	Ages of persons

2. A discussion lead by the teacher would have to be held before the students would understand objectives one and two. Repeated observations would be necessary.
   a. Would students throwing stones be induced by the environment?
   b. Would students throwing sticks and stones in puddles of water be induced by human behavior?
   c. Would student fights be the result of environment induced conflicts or human behavior induced conflicts?

3. Chalkboard lessons in Math would establish an understanding of scale drawing. A physical feature such as, puddles, bushes, and rocks should be included. Abstract figures could designate each activity on the outlined area of the play pad. If there is a conflict or overlapping of activities in a given area this area would be shaded.

4. Why are students attracted to certain landscape features such as water puddles, stones? Why are some areas not used? Where are the problem areas? What is the basic cause of these problems? What solutions to these problems could you suggest (remember what type of problem you are dealing with).

5. Groups could defend their view or solutions in order to help the class decide what they should actually do.

   a. To solve conflicts induced by the environment or to solve conflicts induced by human behavior. How would you solve an environmentally induced conflict? Could you remove it? Could you remodel it? How would this help remove natural behavior conflicts?
   b. What could be done in the unused area?
   c. What materials would you need for your solution? What would be the costs of the solution?
   d. What is the best solution which has been proposed?

6. What the class could do would depend on how motivated and concerned they actually are about the problem. Who could help you with your project? Who is responsible for improving the play pad.

7. Would your plan distract students from environmentally induced conflicts? How else would you plan to improve the play pad?

8. What is the best way to carry out your plan to improve the play pad?

Middle Elementary
Transportation

J. Phillips

INVESTIGATING PEDESTRIAN PATTERNS TO AND FROM SCHOOL

BEHAVIORAL OBJECTIVES:

At the completion of a successful encounter, a student should be able to:

1. Write a short paragraph explaining (number) problems which occur when students walk to school; briefly include possible solutions.
2. Design and carry out a survey of community opinion concerning this issue?
3. List (number) alternatives which could be used to resolve the issue.
4. Identify positive points of each alternative and decide on one as preferred.
5. Design a strategy for implementing the preferred decision with the aid of concerned parties.
6. Carry out the planned strategy for development of pedestrian patterns to and from school.

ACTIVITIES:

1. What problems are encountered by students walking to school? Would sidewalks alleviate the situation?
2. Take a walk in the neighborhood near school and discuss student transportation problems. Is there more than one? Why do they exist? Think of possible decisions.
3. Draw up a survey to determine the communities feelings and ideas concerning the traffic situation, possible solutions, and ways of implementation. Distribute surveys to all families involved in the school community.
4. Analuze the results of the survey. Does the community feel that there is a problem? What do they think are alternatives to the problems?
5. Develop and organize a presentation for township and school personnel. These are the people who handle the economic, planning and social aspects of the issue.

6. Meet with the proper township and school personnel. Present the results of your survey and analysis. Discuss with them various alternatives determined by the above activities.

7. Prepare a community presentation based on results of your meeting with school and township officials. Design charts, overlays and other visual aids to supplement the presentation.

8. Once the plan is approved, seek help from all concerned groups to implement the plan.

Middle Elementary
Water Quality

Richard D. Gwinn

INVESTIGATING QUALITIES OF THE HOME DRINKING WATER OF THE STUDENTS

BEHAVIORAL OBJECTIVES:

At the completion of a successful encounter, the student should be able to:

1. State in writing the source of their drinking water.
2. Show by a diagram or a chart the chemical composition of water.
3. Write an essay on the local water history.
4. State (number) reasons why health standards are set for drinking water in the community.
5. Locate (number) sources of contamination.
6. List (number) potential sources of contamination.
7. Develop strategy to solve water contamination problems if any.
8. State the type of action they could engage in to carry out behavioral objective number 7.

ACTIVITIES:

1. Discuss with parents and determine the source of their drinking water.
   a. Is your source of water a well? How deep is it?
   b. Do a bar graph of each well's depth.
2. Do research in the library to find the chemical composition of water. What are the two most common chemicals? What proportion are they? Are there any other chemicals in water? What are they?
3. Have a nurse discuss the hygenic purpose of drinking water that is acceptable by the health department.
   a. Why do travelers in Europe drink mineral or carbonated water?
   b. Does this mean that the water of European countries is not good water?
   c. Why in some instances are pregnant mothers directed by their doctor to drink distilled water?
   d. What does the health department look for in the water to see if it is good for drinking?

4. Do research on the history of health problems of the area pertaining to drinking water by talking to a health department official and possibly talking to senior citizens of the area.

   a. When did the county health department start checking drinking water?
   b. Why was there a need for checking water?
   c. Were there any epidemics as a result of contaminated drinking water?
   d. Could a visit to the grave yard prove that there were epidemics? How could this be determined?
   e. What scientists have helped man prevent such happenings? How did they prevent epidemics from occurring due to drinking water?

5. Because of the various sources of drinking water in the area a definition and/or diagram of the va ious sources of water would be beneficial to understanding the history and problems of drinking water of the area.

   a. What other sources of water are there?
   b. Which is the most common?

6. The students should take samples of drinking water in clean containers to be checked by the health department.

   a. Do any of the samples have poor quality?
   b. How can they be improved for drinking?

7. What is contaminated water? Where in the neighborhood could it become contaminated? Where is it becoming contaminated?

8. Discuss solutions and apply recommended action by a health department to solve their water contamination problems if any are found.

9. Make a display showing the ingredients in their water other than the chemical composition of water itself.

10. How could you prevent contamination of drinking water? If there is no problem now, how would you see to it that there is none in the future? What sort of action would this require? Would you inform your classmates of what you have found?

11. Develop a plan to solve water contamination problems in the community.

Middle Elementary
Water Quality

Emily Klopfenstein

STUDY OF THE MOSQUITO

BEHAVIORAL OBJECTIVES:

At the completion of a successful encounter, the student should be able to:

1. Describe and draw the life cycle of the mosquito.
2. Define desirable and undesirable habitat for the mosquito.
3. Describe what occurs when an insect attempts to draw blood from a warm blooded animal.
4. List the predators of the mosquito at the larva stage and at the adult stage.
5. List five ways man can control the mosquito population.
6. Describe how such controls might affect other aspects of the environment.
7. Identify a plan for limiting use of an ecologically harmful mosquito control.
8. Carry out publicity in plan to limit use of an ecologically harmful mosquito control.

ACTIVITIES:

1. Seek information in reference books on the life of a mosquito. Does the pond contain mosquito eggs or larvae? Collect a specimen of each stage and chart the life cycle. What is favorable habitat for the mosquito?
2. Discuss different aspects of the mosquito allowing the students to consider why we dislike the mosquito, if it serves any purpose, if we should try to destroy it, etc. Become informed in what occurs when a mosquito bites you. Try to trap some and see if they are male or female. Bring in information about disease bearing mosquitoes in some countries (malaria, typhoid). In general, gather information on the mosquito and why it is considered a problem.
3. Seek out information concerning the natural predators of the mosquito. What birds are there? Are the birds which prey upon them found near the pond? How can they be attracted to the site? What welfare factors are needed? Plan a way man can help institute these plans, build and locate birdhouses, for example. Are fish which are mosquito larvae eaters present? If not, can they be brought to the site?

4. Survey the methods people around the pond used to control mosquitoes. Chemical and biological means should be listed. Compare these methods learned through research as to effectiveness and impact on environment.

5. From the information which has been gathered, work out the results of each control in a hypothetical way. For each control decide if it is effective or if other problems will develop which would be worse.

6. If more controls are identified as harmful to the environment, plan a workable strategy to attempt to limit its popularity and use in ones community. How could students work with concerned agencies? Who are the stores responsible for the sale of this control? Can we ask them to stop selling it? What neighbors in the community use these controls?

7. Who is carrying out a plan of collecting and disposing harmful chemicals? Could the activity be carried out locally? Identify individuals who might help initiate such an activity. Volunteer to publicize the activity for them.