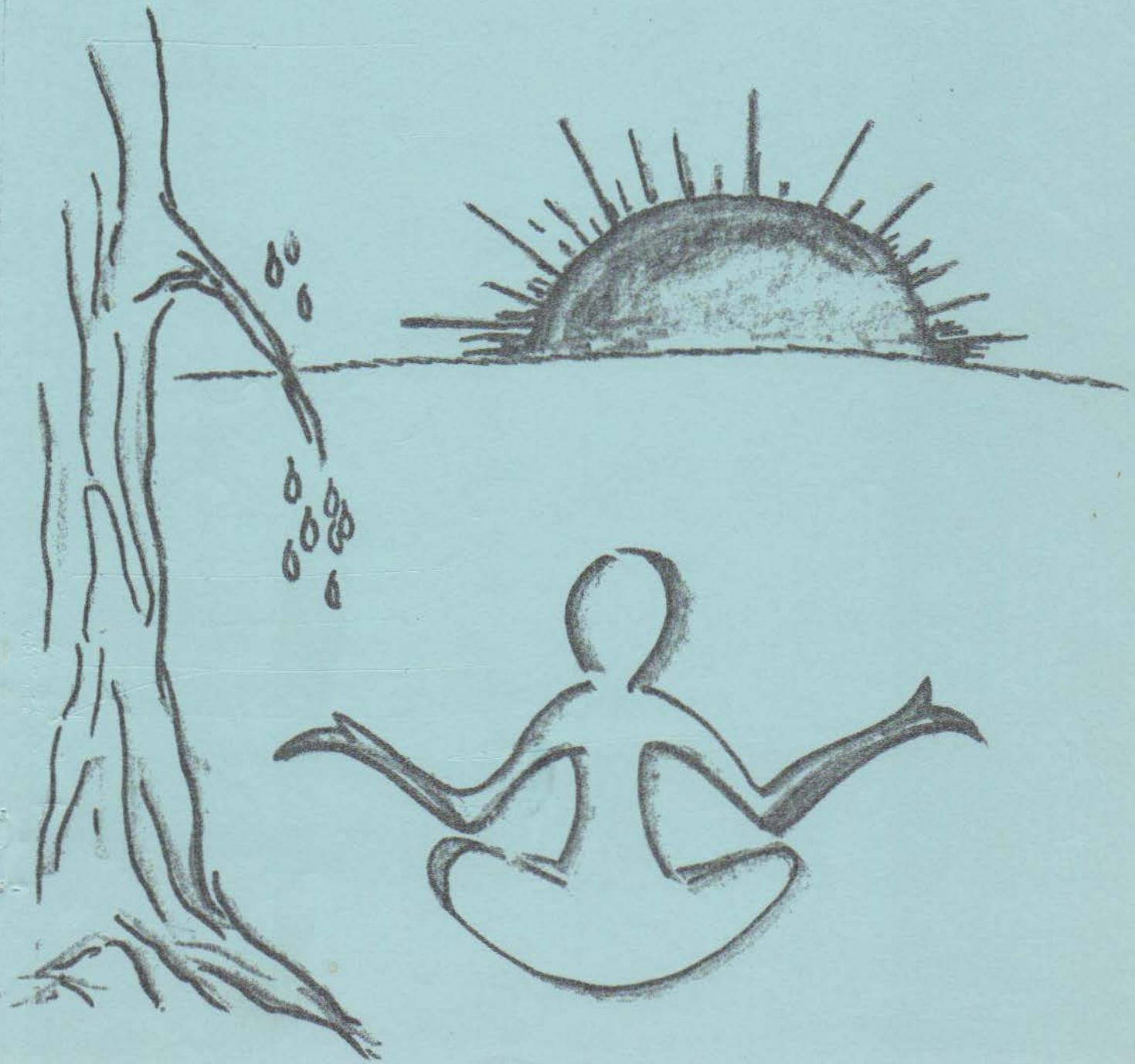
Everglades National Park

.. STEP ..



CONTENTS

STEP ENVIRONMENTAL AWARENESS LEADERSHIP WORKSHOP
THE HISTORY AND STORY OF STEP

"HAVE YOU HUGGED A TREE TODAY?"

Can you look at a mountain sunset with your heart as well as your eyes? Have you ever fallen in love--with the earth? We think the true meaning of love is to give more than we take. If you share these feelings, come and join us. We call ourselves STEP, and we care.

Awareness and Personal Commitment

Members of STEP (Students Toward Environmental Participation) begin by becoming environmentally aware themselves. By participating in the STEP 10-hour Environmental Study Area Leadership Awareness Course, members become aware of the wholeness of the earth and learn to relate to nature in a personal manner. They not only learn the interdependence of all living things, they also learn to use the senses and practice self-expression. More than anything else, STEP is a positive attitude toward the earth.

Communication of Awareness

One of the major functions of STEP is to communicate our awareness to others. In the past this has been focused mainly on elementary school children. We felt that by working with them we not only provided some hope for the future, we also indirectly reached adults by the attitudes and actions of their children. High school and junior high students, teachers, community leaders, and National Park Service employees have been very responsive. We take these people on Environmental Study Area (ESA) walks, using techniques learned in the 10-hour course. For eighth graders and older we also help teach the course.

Environmental Action

After commitment and communication comes action. This action may take several forms. STEP members do their own thing, and the results often make important changes. As a result of action by one group of high school STEP members, the Environmental Protection Agency brought suit against businesses who were polluting a major creek in Atlanta. STEP environmental action projects are bounded only by the imagination of the members.

STEP IS A COMMITMENT OF LOVE FOR OUR ENVIRONMENT AND AN UNDERSTANDING OF OUR PLACE IN IT. It is very loosely structured in order to allow each group maximum freedom to adapt the program to its own individual needs.

History, purpose, and scope of STEP AWARENESS! ENVIRONMENTAL ACTION! COMMITMENT through COMMUNICATION of AWARENESS to others!

I. A LOOK AT THE "BIG PICTURE" - We look at what is happening to our environment by understanding the different attitudes man has had toward the environment. We look at man's different reactions to nature by understanding our own attitude toward environment and toward nature.

A. Find an object that reminds you of yourself. Share it with others by introducing yourself through the object to your group, instead of introducing yourself by name, rank, and serial number. Does this environmental symbol tell your personal story?

B. We will connect ourselves with all of nature and with each other by a "sensory wheel". Feel the connection with the past represented by the earth below and the sky above. We are the present! Think about our mutual futures.

C. What does environment mean? Let's discuss different attutudes of man toward the environment. Can we arrive at a common attitude that we can all comfortably live with? Perhaps the past can serve as a guide.

1. The Judaeo-Christian tradition "to subdue and to replenish" is in contrast to other religious traditions where natural occurrences were worshiped as gods.

a. "To subdue"--an isolated command and
"To replenish"--a fractured fulfillment
"To dress and to keep"--an overlooked requirement that had environmental overtones.

b. Efforts to survive under wilderness conditions.

c. Adventurers who set out to conquer new lands.

2. The agricultural and industrial revolutions provided the tools for man's control; man could now manipulate and exploit nature's resources. Man considered himself above nature--man was "here"--the environment "out there"--a natural reservoir of valuable resources and a receptacle for discarded wastes.

3. In the U.S. a concern for conservation emerged in the 19th century. Some men saw that the earth's resources were limited and could not be exploited forever and that everyday activities of men placed great strain upon the environment as a whole. Because of their ideas, a concern about the use of national land and natural resources in the U.S. gradually developed.

Henry Thoreau -- a prophet before his time, whose love for Walden Pond helped him create both a "sense of place" and a total view of the world.

"I wish to speak a work for Nature, for absolute freedom and wilderness... to regard man as an inhabitant, or a part and parcel of Nature, rather than a member of society.... Nowadays almost all man's improvements, so called, as the buikding of houses and the cutting down of the forest and all large trees, simply deform the landscape, and make it more and more tame and cheap...."

Theodore Roosevelt -- whose deep love of the West, as a place and myth, helped him establish reclamation and conservation laws when he was President. But was conservation and reclamation enough?

By the 1930s, the growing concern for conservation had begun a new way of thinking about man's relationship with the environment. Instead of being above nature, he was considered to occupy a place within the invironment along with other earthy inhabitants.

John Muir -- had recognized this change as early as 1901 when he said: "The tendancy nowdays to wander in the wilderness is delightful to see. Thousands of tired, nerve-shaken, over-covilized people are begining to find out that going to the mountains is going home; that wilderness is a necessity; and that mountain parks and reservations are useful not only as fountains of timber and irrigating rivers, but as fountains of life. Awakening from the stupefying effects of the vice of over-industry and the deadly apathy of luxury, they are trying as best they can to mix and enrich their own little ongoings with those of nature. and to get rid of rust and disease. Briskly venturing and roaming, some are washing off sins and cobweb cares of the devil's spinning in all-day storms on mountains, sauntering in pinewoods or in gentian meadows, brushing through the chaparral, bending down and parting sweet, flowery sprays; tracing rivers to their sources, getting in touch with the nerves of Mother Earth...."

Aldo Leopold:-- gave us a new land ethic and a "sense of place". "Conservation is getting nowhere--when we see land as a community to which we belong, we may begin to use it with love and respect".

B. We see examples of the SPICE STRANDS in history.

The film Buddhism, Man and Nature was never intended to be an ecology film, but the attitudes presented are precisely those needed to solve the problem at its roots. Alan Watts (one of the more popular authors read today on college campuses) presents the idea that man and nature are one process (but one thing--life is a verb, not a noun). Man is part of nature and not its enemy, emptiness and space have value. All life is a process of change which should be cooperated with rather than resisted, and to resist death is to resist life.

SETON WATCHING IN A SPECIAL PLACE

Ernest Thompson Seton was a naturalist who roamed the wild spaces of Canada and the U.S. in the early 1900s. He would sit for hours just observing, immersing himself in the world around him. If you are very relaxed and almost motionless, after 15 minutes or so, the natural world will sweep over you as if you weren't even there. The environment will engulf you as the animals return to their normal patterns of living ignoring you.

C. Literature shows all the SPICE STRANDS in living motion.

1. Poetry patterns always deal with man's feelings by comparing them to nature or the environment.
2. The Giving Tree shows the interdependence of man and his environment.
3. Future Shock -- Contemporary society faces rapid cultural adaptation in response to a spiraling technical evolution. Change occurs so rapidly that man has difficulty in seeing the continuity of life and faces problems in coping or adapting to such changes.

D. The SPICE STRANDS are seen in ecology and the natural environment. Let's find examples fo the STRANDS in the natural world and in the environment around us. We can teach the STRANDS to others by using games and activities that use the senses.

1. Awareness activities that reintroduce us to some very old friends--our senses.

Rock Friend
Sense Of Place Walk

2. Games that illustrate ecological ideas.

Scavenger Hunt
Web Of Life

III. The SPICE STRANDS alone are not enough; you must relate to nature in a personal way, directly or indirectly, before you can communicate it to others. The idea is to strive for a "Sense of Place", to be able to personally identify with a given area or environment and share it.

A. How some individuals have personally viewed their environment and expressed it.

1. Rollo May believes that, "People who have lost the sense of their identity of selves also tend to lose their sense of relatedness to nature."

2. Luther Standing Bear, Sioux Chief: "The old people came to literally love the soil...It was good for the skin to touch the earth, and the old people liked to remove their moccasins and walk with bare feet on the sacred earth...The soil was soothing, strengthening, cleansing and healing."

3. Herbert Clark Johnson: "He who has rolled his pants up to his knees and walked a lowland creek from bank to bank has mixed his pulse with that of land and sea. And though, in after days, he crosses his streams by bridge or log, he'll always feel its beat against his body, even in his dreams.

4. Charles Reich: "Young people today seek out sources such as the sea or forest; they understand the vital need to keep in touch with sources that are close to man's own nature."

5. William Wordsworth: "The loss of the personal feeling for nature was a result of the industrialization of England in the latter part of the 19th century.

6. Herman Hesse: "Home is within you, or home is nowhere at all. A longing to wander tears my heart when I hear trees rustling in the wind at evening. If one listens to them silently for a long time, this longing reveals its kernel, its meaning. It is not so much a matter of escaping from one's suffering though it may seem to be so. It is a longing for home, for a memory of the mother, for new metaphors for life. It leads home. Every path leads homeward, every step is birth, every step is death, every grave is mother.

"So the tree rustles in the evening, when we stand uneasy before our own childish thoughts. Trees have long thoughts, long-breathing and restful just as they have longer lives than ours. They are wiser than we are, as long as we do not listen to them. But when we have learned how to listen to trees, then the brevity and quickness and the childlike hastiness fo our thoughts achieve an incomparable joy. Whoever has learned how to listen to trees no longer wants to be a tree. He wants to be nothing except what he is. That is Home, that is happiness".

Reflect on those "Special Places" which made us feel that we were "Home".

Where was it?
What did it look like?
What do you remember most?
How did it sound? smell?
How did it make you feel when you were there?
Do you go there alone?
Do you take special friends with you?

a. ART -- Can you draw your "Place" using nature's own tools?

b. POETRY -- Share your "Place" with us through Cinquain or Haiku.

c. MUSIC -- What is the rhythm of the environment surrounding your place. Every environment has its own innate symphony of sound if we just listen to it.

IV. WHAT IS AN ESA? An ESA is an Environmental Study Area. This is the place where we can do our thing in terms of relating to the environment and nature using the senses. ESAs may be natural, cultural, or historical areas designated for this type of study or they can be a school playground, a garbage dump, or your own backyard. An ESA is a place to love, feel, and interpret the world.

A. Looking at the factors necessary for an Environmental Study Area

1. A place that shows man's relationship to the environemtn whether it's positive or negative.

2. An overall "sturdiness" so that continued use of the area will not have a devastating effect on the environment.

3. Location that makes the area logistically convenient for regular use by area schools.

B. How to use an ESA using the SPICE STRANDS and "Sense of Place".

ESA "Show and Tell"

C. You learn to become an Environmental Study Area Leader by:

1. Observing an experienced ESA leader conduct a field exercise using the SPICE STRANDS and a "Sense of Place".

2. Discussing ESA techniques with an experienced ESA leader.

D. Each participant will be given the opportunity to present his personal expressions of a "mini-ESA" to the rest of the students in his group. Each participant will be evaluated by the ESA leader. Here is your checklist:

1. Locate a personal "sense of place" as your spot and prepare to interpret the place to the group.

2. Develop an activity for the group using senses and/or expressions.

3. Look at man's effect upon your personal place and predict how the future could change "your place".

4. Communicate with the group about "your place" through the SPICE STRANDS (but without calling them STRANDS) and senses. This is your ESA.

V. PRESENTATION OF CERTIFICATES AND EVALUATION.

What have we learned?
Let's evaluate ourselves and the course.
How can we make the course better?
What did you like most? receive the most value from?

VI. STEP CONTINUES.....

Replication of ideas and activities in the schools.
A personal commitment to the Earth.
I resolve to.....

ENVIRONMENTAL STUDY AREA LEADERSHIP TECHNIQUES

I. General Techniques

A. Participate in any activity you ask others to do.
B. Try not to get in a rut. Look for changes in your ESA on a daily basis.
C. Try new ideas, realizing that all of them will not be as successful as you'd like.
D. Share your successful techniques with others and vice versa.
E. Copy others if you want, but use your own ideas. ESA leadership is very personal.
F. ADAPTABILITY AND FLEXIBILITY: The name of the game! Age groups, cultural backgrounds, degrees of sophistication - all lead to a person's present attitude about his environment. You will have to make adjustments to those with each group you lead.
G. Make sure your environmental ethic is up for the day! Your frame of mind will rub off on your charges.
H. Pick and choose the activities that best suit your ESA and the amount of time you have with each group. In most cases you will have only one shot with the group. Make the most of it!
I. The Circle: Every time we do an activity or stop to discuss something, we form a circle. There are three major reasons for this: (1) Everyone can see and be seen, (2) no one is left out, (3) and most importantly, the circle is representative of the cycle of life of which we are all a part. It is best to have the group form a circle by joining hands while standing. Then when you sit down for discussions and games, you will already be in a circle. Remember: sitting in damp pine straw is part of environmental awareness, but sitting in poison ivy is not at all necessary.

II. "Teaching" Skills

A. Discussion Skills

1. Ask questions to stimulate thinking, not test-type ones.
2. Fit ecological concepts in when you can with ease, not because you think you have to - don't force them.
3. Let your group teach you, and acknowledge this to your group.
4. Encourage curiosity. Let individuals find their own items of interest.
5. Encourage them to question.

B. Control Techniques

1. Tell your group your rules before starting on the trail.
2. Quiet voice, quiet children. (Usually!)
3. Take off quickly for next "stop spot" with eager anticipation.
4. Encourage investigation as a group.

IDENTIFICATION WITH A NATURAL OBJECT

Purpose: To encourage the people to learn to identify with nature, also good as an ice-breaker and in activities involving communications skills.

Preparation: As the people walk along the trail ask each person to pick up a natural object that reminds him of himself. Tell them that these objects will be used in an activity, and be sure to allow sufficient time.

Activity: In a clearing have the group sit in a circle, talk about why activities are done in a circle. Ask the group what they usually say to a person when they are first introduced (name, title, occupation, etc.) Then ask them how much about themselves these things really tell (not very much). Tell them that this time they're going to introduce themselves a little differently. Ask them to share what they are really like by comparing themselves to the object they have chosen. The leader should go first, and <u>every</u> person in the group should have a turn. Encourage openness by being open yourself. Explain beforehand that you do not want scientific definitions and <u>do not</u> allow them. By asking leading questions, the leader may guide those participants who have trouble. Always be encouraging!

BLINDFOLD WALK

Number of Players: No more than 15

Area: Outdoors

Type of Game: Sensitivity

Equipment: Blindfolds

Purpose or Concept: To stimulate the participant's awareness of his environment

Everyone sits down and is told to observe the things around him using all five senses. Get a sense of place. Everyone except the leader is blindfolded. Everyone removes their shoes. A line is formed by everyone joining hands. The walk then begins. Listen to the sounds around you. Use your feet to feel the touch of the earth. The leader then stops the walk, distributes an object for each person to smell and taste. The walk goes on a little further then everyone stops. Ask them to describe what the area looks like, without removing the blindfolds. Then after all ideas have been given, the blindfolds are removed. Were their ideas correct?

"SENSE OF PLACE" WALK

Participants are divided into groups of two. One of the partners is blindfolded and led on a "quite walk" to a particular "place"—the "place" being a tree, a scrub, a landmark. The blindfolded member is left at that spot for enough minutes to orient himself to that "place" and to get to know that place with all of his sences, minus sight. He is then led back to the original point of departure and the blindfold removed. He then tries to find his "place" with his sight "restored", describing various sensations his other sences noticed, to his partner. After finding his "place", partners switch roles, and the activity is repeated. No verbal communication is allowed through the blindfolded walk; trust and communication must be established in non-verbal ways.

THE WEB OF LIFE

Purpose: To illustrate how plants and animals (including man) are dependent upon each other and upon the environment (sun, air, water, and soil) for survival through a "web" of inter-relationships, and what happens if the web is damaged.

Materials: Ball of string, magic marker, "Name" cards

Description: Players form a circle. Each player is given a "name" card which identifies him as some part of the environment, such as the sun, air, water, soil, different types of plants and animals. Be sure to include the four basics (above). The participants should keep their cards face down until the web is made. The leader unwinds the string from player to player, criscrossing back and forth across the circle. When each player is connected, the leader begins by turning over his card and explaining why his connection with the next person is important. After all the participants have explained their importance in the web, the leader lets his end of the string go, resulting in an unraveled web. A discussion follows concerning the interrelatedness of all things in the web, and what happens when the web is upset.

NATURE SCAVENGER HUNT

Number of Players: Optional

Area: Optional

Type of Game: Absorbing nature activity for nature classes

Equipment: Sharp eyes and a nature list

Purpose or Concept: To bring the participant to a greater awareness of the smaller things in nature and where to find them.

The group is divided up into teams. Each team is given a nature list, written like a letter. Example:

Dear Scavenger Hunter,

The big Chief of our tribe has not slept for forty nights. He is getting very tired and sleepy, but just cannot fall asleep. We are to make a sleeping potion. We are to gather the ingredients and cook them up into a stew. The following ingredients must be gathered within the hour or he will have the dreaded disease of the striped leopard: a live frog, 10 dead flies, 2 flower seeds, 4 bird feathers, 2 worms, empty snail shell, oak leaf, discarded snake skin, acorn, a bit of quartz, pine needle, pine cone, bit of animal fur, and a little dirt.

Thank you,

Black Eagle
Medicine Man

The team bringing in the largest number of items within the time limit wins the game.

ROCK FRIEND

Purpose: To increase the awareness of senses other than sight in the participants.

Description: Ask each person to find a rock. Sitting in a circle, ask each person to feel his rock carefully. Tell them to get to know their rock as if it were their best friend. Then ask everyone to pass their rocks to you. Pass the rocks back out to your right and have the people identify their rock. After all the rocks have been identified, take the rocks back up. Now have the participants close their eyes, and identify their rock by how it feels. Do not tell them in advance why they are feeling the stone and emphasize the importance of not looking at the stone. After everyone has his rock, tell them that this is their "rock friend", and they may do whatever they want with it. Suggest that they give it to a special friend without that friend knowing where the rock came from.

ANGLES

Purpose: To illustrate the fact that any object has more than one side to it, and to increase sensory awareness

Activity: Have the group sit in a circle. The leader picks up a natural object, such as a pine cone, and passes it around the circle. As each person receives the object, he must describe it from a different point of view. Encourage participants to use senses other than their sight. Imagination on the part of the leader is a must.

SCAVENGER HUNT

Purpose: To awaken ones' awarness to detail around him

Materials: Lists of things to hunt

Description: Depending on the size of the group, have the participants divide themselves into groups of 2,3, or 4 people. Give them about 20 minutes to collect their things. When all the groups have returned, let them share with the others what they found. You may have to elaborate a bit on some of the articles listed depending on the age and sophistication of the people. Also, don't be afraid to make up your own list or make changes in this list.

Each group will collect evidence of the following phenomena:

1. A simple machine
2. Three simple shapes
3. A sweet and sour taste in Nature
4. A pleasant and unpleasant smell in Nature
5. A trace from an animal
6. Three primary colors and two secondary colors
7. Three different texture
8. One sound from Nature
9. An example of non-biodegradable litter being degraded
10. Something older than you and something younger
11. A producer, a consumer, and a decomposer

NATURE'S KALEIDOSCOPE

Purpose: To illustrate how color enables a plant or animal to adapt to its environment.

Materials and Preparation: 100-200 colored toothpicks. Count the number of each color. There should be an equal number of each color. Leader selects an area with as much variety of ground cover as possible. He scatters the toothpicks over the area. The object is not to hide the toothpicks, but to scatter them over a wide area.

Description: Following a discussion on adaptation and interrelatedness, including protective coloration and coloration for attraction (such as reproduction), the leader takes the group to the area where the toothpicks have been scattered. They are instructed to find as many toothpicks as possible, paying attention to the colors they find and where. After approximately five minutes, call the group to sit in a circle. Count the numbers of the different colors, and compare these to the numbers scattered. Discuss where the various colors were found, and why.

LEAF HUNT

Number of Players:	Optional
Area:	Woods
Type of Game:	Active game for both the mind and the body. The gathering and labeling of leaf specimens
Equipment:	Slips of paper
Purpose or Concept:	To teach the participant the names of different types of leaves.

Divide the group into teams. The teams are given 10 minutes to gather one leaf from as many different kinds of trees as they can find. When everyone has gathered together again, arrange the leaves on the ground. Then place slips of paper with the names next to them. The team with the most leaves correctly identified wins the game.

LEAF MATCHING

Number of Players: Optional

Area: Woods

Type of Game: Active game for stimulation of body and mind.

Equipment: None

Purpose or Concept: To increase the participant's knowledge of the identity of different kinds of leaves

Teams are given a limited time to collect one leaf from as many different trees as they can find. One team displays a leaf, identifies it and scores 5 points. First other team to hold up similar leaf scores 10 points, other teams that have leaf score 5 points each. Team first to identify holds up next leaf, and so on. If a team identifies incorrectly the leaf it holds up, it scores nothing, but the team first to correct the mistake scores 10 points extra.

NATURE CLUES

Number of Players: Optional

Area: Woods or Park

Type of Game: Absorbing nature activity

Equipment: Sharp eyes and a nature list

Purpose of Concept: Bring the participant to a greater awareness of the smaller things in nature.

The group is divided up into teams of 4 members and given a nature list. This list is made up of clues of what the object to be found is. Example:

1. green, sharp, and often cut
2. an animal I once kept warm; without this bit there is no harm
3. green with leaves and considered lucky
4. a little creeper, and soon a sleeper
5. I'm long, thin, sharp, and fragrant
6. hard and sometimes thrown around
7. I'm gathered by an animal and stored for future meals
8. the beginning of life
9. a half-foot long, I ought to be, a tiny part some big tree
10. sometimes brown, sometimes black, or maybe even red. I'm part of this earth, it's said
11. at Christmas time, I'm often seen, painted, plain, but seldom green.

After a limited time the teams return and show what they have found.

SYMPHONY OF NATURAL SOUNDS

Purpose: Increase one's sound awareness and to understand that all man-made sounds (guitars, car horns, etc.) are based on some natural sound.

Description: Have the group sit in a circle. Begin by asking them what man-made sounds are based on. Use examples such as flutes (birds), bass horns (bears), and pianoes (butterflies), to illustrate the point. Next, have a few seconds of sound awareness with the group. A good follow-up would be to have each group member find a natural object that makes noise and have a symphony of natural sounds. You may want to tape this and play it back to the group.

As a contrast to the sounds made by natural objects or those that resemble a natural environment, identify those sounds that make up a man-made environment; school yard at 3:00 p.m.; downtown in the largest department store on Christmas Eve; parking lot at quitting time of a factory; home just before dinner. Have each person imitate one "sound", record the sounds together, contrast the natural and man-made environments.

ENVIRONMENT

Number of Players: Optional

Area: Optional

Type of Game: Thoughtful

Equipment: Paper and pencil

Purpose or Concept: To stimulate the participant's creativity with words

Give the group the word "environment" and let them find all the words they can from it. Then use the words and see how they are related to the environment. Example of words contained within the word "environment"--men, me, no, not, none, net, venom, mover, vine, on, rot, rent, vent.

TREASURE HUNT IN NATURE

Number of Players:	10 or more
Area:	Woods or Park
Type of Game:	Active outdoor observation for the sharp-eyed and fleet of foot
Equipment:	Envelope and card
Purpose or Concept:	Teach the participant to follow directions in order to get somewhere.

The group divides up into teams. Each team gets a sealed envelope. At a given time the envelopes are opened. There is a card inside which reads something like this:

"Go to the tallest oak you see from this point." At the oak is a sign. The sign reads, "Follow the direction of the longest branch to the smallest pine tree." There the team finds another message, "Turn southwest and walk to the boulder." In the crevice there is another message. It reads, "To apple tree." There is only one apple tree in the area, it must be it. The messages keep going until the last one which is, "Look under the stump which came up out of the ground due to the ice storm." Here the winning team finds the treasure--candy, peanuts, or what have you.

SCRAMBLED NAMES

Number of Players:	Optional
Area:	Inside or Outside
Type of Game:	Thoughtful, absorbing
Equipment:	Paper and pencils. List of scrambled names
Purpose or Concept:	To familiarize the participants with the names of objects in nature

Each team is given a list of 20 or more scrambled names of things in nature to unscramble. Example:

1. podowkrece	2. mosetuti	3. nidralac
4. irepds	5. kmeony	6. tmsaupiophop
7. shroe	8. eargposhprs	9. smoeu
10. atr	11. rcpsue	etc., etc., etc.

NATURE QUIZ

Number of Players:	Optional
Area:	Indoors or Outdoors
Type of Game:	A game for the quick-minded. Remembering of facts about objects in nature
Equipment:	Sharp ears and a quick train of thought
Purpose or Concept:	Distinguishing between true and false statements made about nature

Divide the group into two teams. Choose a leader and let him read a list of statements, one to each team. They are to distinguish whether the statement is true or false and give a reason for their answer. Example: elephants have wings, snakes live in caves, bears hibernate, all animals have hair, rabbits are insects, toads cause warts, horses have strips on their backs, plants have no roots. The game should be played in the form of a spelling bee.

NORTH, SOUTH, EAST OR WEST

Number of Players:	Optional
Area:	Woods or Park
Type of Game:	The use of compasses in telling directions
Equipment:	Compasses
Purpose or Concept:	Teach the participant to use a compass in giving and in following directions

Divide the group into teams of 3 to 5 members. Each member is given a compass and the team is given instructions to plan a trail to some destination. Each trail is to start at a fixed point. Use a compass to describe directions and the pace to measure distance. When each trail has been mapped out, have the teams exchange written directions for the trails and attempt to follow each other's directions. Start off something like this: "Go 15 paces northwest toward the wooden fence."

WHAT AM I?

Number of Players:	No more than 20
Area:	Inside or outside in a cleared area
Type of Game:	A game of thought
Equipment:	File cards
Purpose or Concept:	To get the participant to become aware of things pertaining to different objects of nature, and be able to identify the object.

The cards should each have the name of a bird, a tree, or something else from nature on them. Put a name card on the back of each player without letting the player know what name he has. Players circulate and ask each other questions. These questions should be answered with "yes," "no," or "I don't know." Only 5 questions may be asked of any one person. Each player then tries to figure out what his identity is.

NATURE'S TWENTY QUESTIONS

Number of Players:	Optional
Area:	Optional
Type of Game:	Thoughtful
Equipment:	Sharp mind
Purpose or Concept:	To stimulate the mind of the participant on the subject of physical aspects of nature specimens.

Everyone gather around in a comfortable group. One person assumes the identity of an object in nature, without revealing the name. The players are to find out what he is. He can answer only by shaking his head yes or no.

UNNATURAL NATURE

Number of Players:	Optional
Area:	Camp, Playground, or park
Type of Game:	Active outdoor observation for the sharp-eyed and fleet of foot.
Equipment:	String, Note Cards
Purpose or Concept:	To stimulate the participant's observation of his surrounding area by placing "oddities" to be found.

In a small area, add unnatural things to plants. Tie oak leaves on a pine tree, pine cones on a spruce tree, rock on a tree limb. Send out teams to discover these oddities.

Team bringing back report of greatest number of oddities within certain time limit wins. Score extra if team identifies the original and unnatural plant.

IDENTIFYING NATURE OBJECTS

Number of Players:	Optional
Area:	Indoors
Type of Game:	Observation and Thought
Equipment:	Table, tablecloth, nature objects
Purpose or Concept:	To stimulate the participant's awareness of items when they are seen for only a minute. Also, to teach them to work in teams cooperatively.

Place nature objects on a table, then cover them with the tablecloth. Let the teams gather around the table. Remove the cloth for approximately one minute to reveal from 20 to 50 nature objects. Teams go into huddle and list as many items as they saw. The team with the most complete list wins.

WINDY WIND

Number of Players:	Optional
Area:	Optional
Type of Game:	The influences of wind on climate
Equipment:	Keen senses
Purpose or Concept:	To enable participants to draw inference about animal and plant life from observation of certain habitats

This investigation should be done on a windy day. Work alone or with a team of two or three students. Find the places that are the windiest and write them down. Describe what you see around these areas.

Compare the results of your observations with the other teams. What could you do to provide food and protection for the birds and small animals in these areas?

Compare the plants that are growing in a sheltered area with those growing in the windy areas. Examine the soil. Notice the difference in the soil in both areas. Compare the animals found in these various places.

MAGIC GLOB

A magic glob is an invisible bit of magic which we can shape into anything at all with our hands and our imaginiations.
Have your group sit in a circle, and explain what the magic glob is as you shape something with your hands Explain that the idea is to make something that you like, and then give it to the person next to you. That person should be very careful to receive just what you made, and then shape the magic glob into his or her special thing. Can everyone tell at each point just what the magic glob is becoming? (No need to name things out loud until the end: in fact, the game works best when played in silence.)

BIOME GAME

Biome is a fancy word for world-wide ecological units, such as tundra, desert, grassland, etc. We're using it here to mean "universal places" that everyone has probably experienced. Creating a biome here is to set the scene in pantomime, a fifteen to thirty second tableau or silent drama that quickly gives the watching audience a sense of the place.

Divide your group into small groups, and give each a biome to represent. Or, let groups give each other biomes to do, charades-style. Let each team have a few miniutes to determine how they want to mime the biome, and to do a little rehearsing.

Some possibilities:
- a day at the beach
- a picnic interrupted by a thunderstorm
- cold windy night in the city
- waiting in line
- crowded elevator
- airplane
- supermarket
- a walk in the woods
- fishing
- the stands at a baseball (basketball, etc.) game
- marching band/ parade

FRAMING

Purpose: To increase one's visual awareness and to accentuate detail by blocking one interference.

Description: Have the group sit in a circle. Begin by pointing out that the most expensive and invaluable camera a person has is his own eye. To illustrate this point, have the group make a "framer" using their fingers in a square shape. Have them focus on far away objects and on close up objects. By moving their fram, the participants can have "pictures" of the same object, but with more or less detail in the background. Also, have them focus on not only an object, but the empty space around the object. Use your imagination.

SOUND AWARENESS

Purpose: To increase awareness of natural sounds

Description: In a quiet spot off the trail let everyone sit in a circle and be as quiet as possible. Once they are quiet, ask them to close their eyes and listen for as many different sounds as possible. After about 15-30 seconds ask them what sounds they hears. This activity can lead to good discussions of different levels of awareness we experience.

Student's Names _____

_____

MINI WORLD

List all the different items you can find inside your hanger. List one item per square. If you cannot name the item, then in a few words describe it. Circle whether the item is an animal, a plant, or a mineral and if it is living or dead.

Animal Plant Mineral Living Dead	Animal Plant Mineral Living Dead	Animal Plant Mineral Living Dead
Animal Plant Mineral Living Dead	Animal Plant Mineral Living Dead	Animal Plant Mineral Living Dead
Animal Plant Mineral Living Dead	Animal Plant Mineral Living Dead	Animal Plant Mineral Living Dead

Connect items that need each other with lines. Many items will have several "need" lines.

"Word" CINQUAIN

1. _____

2. _____ _____

3. _____ _____ _____

4. _____ _____ _____ _____

5. _____

1. Use one word to name the subject you are writing about.

2. Use two words to describe #1.

3. Use three words about what #1 is doing.

4. Use four words to tell how you feel about #1.

5. Use a word that means the same as #1.

In the strict poetic sense, cinquain poetry (pronounced san (d) cane) has few lines with a certain number of syllables per line.

2
4
6
8
2

Instead of a number of words. You might try to get fancy as you go on with poetry. Look at Haiku next. Form is not the important factor, the expression of feelings is. Poetic licinse allowed and encouraged!

Haiku is a three line verse form which originated in thirteenth century Japan.

Characteristics of Authentic Haiku:

Three lines: Line 1 contains 5 syllables; Line 2 contains 7 syllables; Line 3 contains 5 - 17 syllables in all.
English translations do not always follow this pattern.

Each poem includes the season, location, reference to nature.

No subject matter deals with simple ordinary things.

No rhyme (Japanese words end in vowels or "n" sounds)

Few articles or pronouns - syllables can be used for better purpose.

Thought comes first; then the syllables are adjusted to fit the form.

Examples of Haiku for inspiration and demonstration by the Japanese masters.

Departing spring
Hestates
In the late cherry-blossoms

Buson

Simply trust:
Do not the petals flutter down
Just like that?

Issa

The old pond;
A frog jumps in, --
The sound of the water.

Basho

ACTIVITIES FOR SELF-EXPRESSION.....

Haiku and Cinquain Poetry

Poetry forms or other self-expression activities are used most effectively in the middle or near the end of an ESA hike. Ask the participants to write about something they have experienced in the ESA up to that point (a sound, a smell, an object, a thought, a feeling, etc.) Let those who wish to do so share their poetry with the others.
(See the formats for Haiku and Cinquain)

Group Story

At a spot that particularly sparks the imagination, let the group make up a story. You could start it off, then let each person add something to the story. Focus on a natural object, such as "Sammy Sun" or "Timmy Tree"; focus on a central object in the environment like a building, a chair, a lamp post.

Group Poetry

Group poetry can be done by letting each person write a line or two as part of one whole poem.

Wishful thinking

Pick a good spot where everyone can sit or lie down and be quiet for a few moments. Then ask each person, "If you could be anything other than a human being, what would you like to be out here and why?"

Some Student Expressions

EARTHQUAKE

A monster trying
To escape from his dungeon
Beneath the earth's crust.

Bob Thompson

THE SEA

The sea is like life —
Mighty, big, and beautiful
At dawn and at dusk.

Jimmy Farnsworth

MOTHER TREE

Stretching out her arms
To protect the world from the
Fury of the skies.

Judy Harrison

SADNESS

The dying of the flowers,
The turning of the grass, the autumn bre

Jean Gregory

ENVIRONMENTAL EDUCATION ACTIVITIES FOR STUDENTS

I. Using the following checklist, determine environmental trouble areas in your community and suggest how each of the problems might be prevented or corrected.

Community_____	Potential Problem	Major Problem	Moderate Problem	Minor Problem	Not Relevant
a. Refuse and garbage disposal (dumps, landfills, etc.)					
b. Junk car disposal					
c. Air pollution					
d. Water pollution					
e. Soil pollution					
f. Noise pollution					
g. Littering					
h. Vandalism					
i. Overhead power lines					
j. Outdoor advertising (billboards, signs, etc.)					
k. Preservation and development of historic landmarks					
l. Preservation of unique landmarks					
m. Substandard residential area					
n. Unsightly or delapidated buildings					
o. Unsightly commercial areas or strips					
p. Unregulated suburban developments					
q. Inadequate or unsightly roads or highways					

	Potential Problem	Major Problem	Moderate Problem	Minor Problem	Not Relevant
r. Abandoned open pits					
s. Soil erosion					
t. Preservation and development of waterways and water-fronts; include canals, reservoirs, rivers, streams, and lakes					
u. Landscaping along highways, roads, public housing and other government property, and semi-public lands (as parking lots)					
v. Unsightly large areas of vacant property (as abandoned military, urban renewal or highway demolition, etc.)					
w. Excessive deforestation					
x. Others					

Identifying the Impact of an Environmental Problem in Your Community:

II. *Using the checklist, personally interviewing at least 50 people from different age groups and walks of life in your community to determine which concern is considered to be of highest priority to those interviewed. Their primary concern then becomes your problem of study. In addition to the personal interview, you could also use the telephone to obtain the desired information.*

COMMUNITY ENVIRONMENTAL CONCERN

What do you feel are the most urgent environmental concerns? (Please rank the major categories by number in order of priority. Do the same for each of the elements within the categories.)

Major Categories

_____ Population Problems
_____ Transportation Problems
_____ Energy Problems
_____ Resource Depletion
_____ Natural Environment
_____ Aesthetics
_____ Materialism
_____ Planning, Design, and Construction Problems
_____ Economic-Social-Cultural Problems
_____ Knowledge Gaps
_____ Health Hazards
_____ Water Problems
_____ Land Use Problems
_____ Air Problems
_____ Others*

Elements Within Major Categories

Population Problems

_____ Distribution
_____ Growth rate
_____ Rural out-migration
_____ Drain on nonrenewable resources
_____ Others*

Transportation Problems

_____ Highway construction
_____ Lack of adequate mass transit systems
_____ Traffic congestion
_____ Others*

Energy Problems

_____ Fuel shortages
_____ Lack in development of alternate energy resources
_____ Lack of efficiency in use and production
_____ Others*

Environmental Concerns (continued)

Resource Depletion

_____ *Lack of recycling for nonrenewable resources*
_____ *Improper management of renewable resources*
_____ *Others**

Natural Environment

_____ *Endangered animal species*
_____ *Endangered plant species*
_____ *Loss of natural habitat*
_____ *Others**

Aesthetics

Distracting:

_____ *Sights*
_____ *Sounds*
_____ *Smells*
_____ *Others**

Materialism

_____ *Excessive waste in packaging*
_____ *Lack of durable, long-lasting goods*
_____ *Status products*
_____ *Consumerism (Product knowledge)*
_____ *Others**

Planning, Design, and Construction Problems

_____ *Aesthetically and functionally poor architectural design*
_____ *Lack of comprehensive regional planning*
_____ *Lack of environmental understanding and concern among planners, designers, and contractors*
_____ *Inadequate and shoddy construction*
_____ *Others**

Economic-Social-Cultural Problems

_____ *Apathy and lack of leadership in problem solving*
_____ *Failure of society to meet human psychological needs*
_____ *Harmful social and work environments*
_____ *Lack of adequate housing*
_____ *Lack of adequate job opportunities*
_____ *Life styles which are detrimental to environmental quality*
_____ *Loss of cultural identity and cultural shock*

Environmental Concerns (continued)

Economic-Social-Cultural Problems (continued)

_____ *Poverty*
_____ *Consumer problems (prices)*
_____ *Others**

Knowledge Gaps

_____ *Lack of programs to find and promote solutions to environmental problems*
_____ *Lack of solutions to environmental problems*
_____ *Lack of understanding of environmental problems*
_____ *Others**

Health Hazards

_____ *Air pollution*
_____ *Pesticides, herbicides, and toxic metals*
_____ *Food additives*
_____ *Noise*
_____ *Radiation*
_____ *Water pollution*
_____ *Others**

Water Problems

_____ *Contamination of ground and surface waters by chemicals, dyes, etc.*
_____ *Flood control*
_____ *Lack of water use plans*
_____ *Limitation of fresh water supplies*
_____ *Sedimentation*
_____ *Thermal discharges*
_____ *Soft waste disposal*
_____ *Solid waste disposal*
_____ *Agricultural runoff (fertilizers, pesticides, and herbicides)*
_____ *Others**

Land Use Problems

_____ *Erosion*
_____ *Inadequate zoning and planning*
_____ *Loss of parks, open space, wetlands, and natural areas*
_____ *Siting of facilities, e.g., nuclear power plants, power transformers and lines, etc.*
_____ *Loss of agricultural lands due to urbanization and inundation*
_____ *Mining operations*
_____ *Solid waste disposal*
_____ *Visual blight (litter, billboards, etc.)*
_____ *Lack of land ethic*
_____ *Others**

Environmental Concerns (continued)

Air Problems

Emissions:

_____ *Trash burning, furnaces in homes*
_____ *Industrial and power plants*
_____ *Automobiles, trucks, buses, airplanes, motorcycles*
_____ *Others**

**Difficulties in citing the many concerns on this form cause the writer to urge you to provide any additional examples you might think of.*

NOTE: This checklist or questionnaire should include (1) space for the respondent to state his or her name, profession, and address and (2) special direction for completing.

Please return completed questionnaire in the enclosed self-addressed, stamped envelope.

Narration adapted from a speech by Chief Seattle of the Duwamish tribe, Washington territory, in 1855, when Indians were still people of dreams and believed their land and their destiney to be inseperable.

THIS EARTH IS SACRED

The great chief in Washington
sends word that he wishes to buy our land.
The great chief also sends us words of friendship and good will.
This is kind of him.
We know he has little need of our friendship in return.
But we will consider your offer--
For if we do not sell
The white man may come with guns and take our land.

How can you buy or sell the sky, the warmth of the land?
The idea is strange to us.
If we do not own the freshness of the air and the sparkle of the water
How can you buy it from us?
We will decide in our time.

What Chief Seattle says the great chief in Washington can count on
As truly as our white brothers can count on the return of the seasons
My words are like the stars:
They do not set .

Every part of this earth is sacred to my people
Every shiney pine needle
Every sandy shore
Every mist in the dark woods
Every clearing and humming insect
Is holy in the memory and experience of my people.

The sap which courses through the trees
Carries the memories of the red man.
The white man's dead forsake the country of their birth
When they go to walk among the stars.
Our dead never forget this beautiful earth
For it is the mother of the red man.
We are part of the earth and it is part of us.
The perfumed flowers are our sisters
The deer, the horse, the great eagle
These are our brothers.
The rocky crests, the juices in the meadows,
The body heat of the pony and man
All belong to the same family.
So when the great chief in Washington sends word that he wishes to buy our land
He asks much of us.

The great chief sends word he will reserve us a place
So that we can live comfortably to ourselves.
He will be our father
And we will be his children. But
Can that ever be?

God loves your people
But has abandonded his red children.
He sends machines to help the white man with his work
And builds great villages for him.
He makes your people stronger every day.
Soon you will flood the land
Like the rivers which wash down the canyon after a sudden rain.

But my people are an ebbing tide,
We will never return.
No, We are separate races.
Our children do not play together
And our old men tell different stories.
God favors you and we are orphans
So we will consider your offer to buy our land.
But it will not be easy
For this land is sacred to us.
We take pleasure in these woods.
I do not know.
Our ways are different from your ways.

This shiney water that moves in the streams and rivers
Is not just water
But the blood of our ancestors.
If we sell you land
You must remember that it is sacred
And that each ghostly reflection in the clear water
Of the lakes
Tells of events and memories in the life of my people.
The water's murmer is the voice of my father's father.
The rivers are our brothers.
They quench our thirst.
The rivers carry our canoes and feed our children.
If we sell you our land
You must remember and teach your children
That the rivers are our brothers and yours.
And you must henceforth give the rivers
The kindness you would give any brother.

The red man has always retreated
before the davancing white man
As the mist of the mountain runs before the morning sun.
But the ashes of our fathers are sacred.
Their graves are holy ground
And so these hills, these trees,
This portion of earth is consecrated to us.

We know that the white man does not understand our ways.
One portion of land is the same to him as the next
For he is a stranger who comes in the night
A nd takes from the land whatever he needs.
The earth is not his brother but his enemy.
A nd when he has conquered it , he moves on.
He leaves his fathers graves behind.
And he does not care.
He kidnaps the earth from his children.
He does not care.
His fathers graves and his childrens birthright are forgotten.
He treats his mother the earth
A nd his brother the sky
As things to be bought and sold like sheep or bright beads.
His appetite will devour the earth
And leave behind only a desert.

I do not know.
Our ways are different from your ways.

The sight of your cities
Pains the eyes of the red man.
But perhaps it is because I am a savage
And do not understand.
There is no quiet place in the white man's cities
No place to hear the unfurling of leaves in Spring
Or the rustle of insects wings.
But perhaps it is because I am a savage
And do not understand.
The clatter only seeks to insult the ears.
And what is there to life
If a man cannot hear the lonely cry of the whiporwill
Or the arguments of the frogs around a pond at night?
But I am a red man and do not understand.
The Indian prefers the soft sound of the wind
Darting over the face of the pond
And the smell of the wind itself
Cleansed by a midday rain
Or scented with a pinyon pine.
The air is precious to the red man,
For all things share the same breath
The beast, the tree, the man
They all share the same breath.

The white man does not notice the air he breathes
Like a man dying for many days
He is numb to the stench.
But if we sell you our land
You must remember that the air is precious to us.
The air shares its spirit with all the life it supports.
The wind that gave our grandfather his first breath
Also receives his last sigh.
A nd the wind must also give our children
The spirit of life.

A nd if we sell you our land
You must keep it apart and sacred as a place
Where even the white man can go to taste the wind
That is sweetened by the meadow's flowers.

So we will consider your offer to buy our land.
If we decide to accept
I will make one condition:
The white man must treat the beasts of the land
Like his brothers.
I am a savage and I do not understand any other way.
I have seen a thousand rotting buffalos on the prairie
Left by the white man who shot them from a passing train.
I am a savage and I do not understand
How the smoking iron horse can be more important
Than the buffalo that we kill only to stay alive.

What is man without the beasts?
If all the beasts were gone
Man would die from the great lonliness of spirit
For whatever happens to the beasts so happens to man.

All things are connected.
Whatever befalls the earth
Befalls the sons of the earth.
You must teach your children
That the ground beneath their feet is the ashes of our grandfathers
So they will respect the land.
Tell your children that the earth is rich
With the lives of our people.
Teach your children what we have taught our children:
That the earth is our mother.
Whatever befalls the earth, befalls the sons of the earth.
If men spit upon the ground
They spit upon themselves

This we know:
The earth does not belong to man
Man belongs to the earth.
This we know.

All things are connected
Like the blood which unites one family.
All things are connected.
Whatever befalls the earth
Befalls the sons of the earth.

Man did not weave the web of life
He is merely a strand in it.
Whatever he does to the web
He does to himself.

No, Day and night cannot live together

Our dead go to live in the earth's sweet rivers.
They return for the silent footsteps of Spring
And it is their spirit running in the wind
That ripples the surface of the ponds.

We will condider why the white man wishes to buy the land.
What is it that the white man wishes to buy
My people ask me.
The idea is strange to us.
How can you buythe sky
The warmth of the land, The swiftness of the antelope?
How can we sell these to you
And how ca n you buy them?
Is the earth yours to do with as you will
Merely because the red man sighs a piece of paper
And gives it to the white man?
If we do not own the freshness of the air
And the sprakle of the water
How can you buy them from us?
Can you buy back the buffalo once the last one has been killed?

But we will consider your offer.
For we know that if we do not sell
The white man may come with guns and take our land.

But we are primitive.
And in his passing moments of strength
The white man thinks that he is a god who already owns the earth.
How can a man own his mother?

But we will consider your offer to buy our land.
Day and night cannot live together.
We will consider your offer to go to the reservation you have for my people.
We will live apart and in peace.

It matters little where we spend the rest of our days.
Our children have seen their fathers humbled in defeat.
Our warriors have felt shame.
Ond after defeat they turn their days in idleness
And contaminate their bodies with sweet foods and strong drink.

It matters little where we pass the rest of our days.
They are not many.
A few more hours, a few more winters
And none of the children of the great tribes
That once lived on this earth
Or that roam in small bands in the woods
Will be left to mourn the graves of a people
Once as powerful and hopeful as yours.

But why should I mourn the passing?
Tribes are made of men, nothing more.
Men come and go
Like the waves of the sea.
Even the white man whose god walks and talks with him
As friend to friend
Cannot be exempt from the common destiny.

We may be brothers after all.
We shall see.

One thing we know
which the white man may one day discover:
Our God is the same God.

You may think now that you own him as you wish to own our land.
But you cannot.
He is the god of man.
And his compassion is equal
For the red man and the white man.

This earth is precious to him
And to harm the earth is to heap contempt on its creator.
The whites too shall pass—
perhaps sooner than all other tribes.
Continue to contaminate your bed
And you will one night suffocate in your own waste.

But in your perishing you will shine brightly.
Fired by the strength of the god who brought you to this land
And for some special purpose
Gave you dominion over this land and over the red man.
That destiny is a mystery to us
For we do not understand.

When the buffalo are all slaughtered
The wild horses are all tamed
The secret corners of the forest heavy with the scent of many men
And the view of the ripe hills blotted by talking wires—
Where is the thicket? Gone.
Where is the eagle? Gone.
And what is it to say goodby to the swift and the hunt?

The end of living and the begining of survival.

God gave you dominion over the beasts
The woods and the red man.
And for some special purpose.
But that destiny is a mystery to the red man.

We might understand
If we know what it is that the white man dreams.
What hopes he describes to his children on long winter nights
What visions he burns unto their minds
So that they will wish for tomorrow

Our dead go to live in the earth's sweet rivers.
They return for the silent footsteps of Spring
And it is their spirit running in the wind
That ripples the surface of the ponds.

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Can you buy back the buffalo once the last one has been killed?

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But we are primitive.
And in his passing moments of strength
The white man thinks that he is a god who already owns the earth.
How can a man own his mother?

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Day and night cannot live together.
We will consider your offer to go to the reservation you have for my people.
We will live apart and in peace.

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They are not many.
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And none of the children of the great tribes
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Like the waves of the sea.
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Cannot be exempt from the common destiny.

We may be brothers after all.
We shall see.

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Fired by the strength of the god who brought you to this land
And for some special purpose
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That destiny is a mystery to us
For we do not understand.

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And what is it to say goodby to the swift and the hunt?

The end of living and the begining of survival.

God gave you dominion over the beasts
The woods and the red man.
And for some special purpose.
But that destiny is a mystery to the red man.

We might understand
If we know what it is that the white man dreams.
What hopes he describes to his children on long winter nights
What visions he burns unto their minds
So that they will wish for tomorrow

But we are savages.
The white mans dreams are hidden from us
And because they are hidden, we will go our own way.
For above all else
We cherish the right of each man to live as he wishes
However different from his brothers.

There is little in common between us
So we will consider your offer to buy our land.
If we agree
It will be to secure the reservation you have promised.
There perhaps we may live out our brief days as we wish.

When the last red man has vanished from this earth
And his memory
Is only the shadow of a cloud moving across the prairie
These shores and forest will still hold the spirits of my people.
For they love this earth
As the newborn loves its mothers heartbeat.

If we sell you our land
Love it as we've loved it
Care for it as we've cared for it
Hold in your mind the memory of the land
As it is when you take it
And with all your strength
With all your mind
And with all your heart
Preserve it for your children
And love it as God loves us all.

One thing we know:
Our God is the same God.
This earth is precious to him.

Even the white man cannot be exempt from the common destiny.
We may be brothers after all.
We shall see.

adapted from a translation by
William Arrowsmith

But we are prayers.
The white race dreams are hidden from us
And because they are hidden, we will go our own way.
For above all else
We cherish the right of each man to live as he wishes
However different from his brothers.

There is little in common between us
So we will consider your offer to buy our lands.
If we agree
It will be to secure the reservation you have promised.
There perhaps we may live out our brief days as we wish.

When the last red man has vanished from this earth
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Is only the shadow of a cloud moving across the prairie
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Love it as we've loved it
Care for it as we've cared for it
Hold in your mind the memory of the land
As it is when you take it
And with all your strength
With all your mind
And with all your hearts
Preserve it for your children
And love it as God loves us all.

One thing we know
Our God is the same God.
This earth is precious to him.

Even the white man cannot be exempt from the common destiny.
We may be brothers after all.
We shall see.

Adapted from a translation by
William Arrowsmith

ENERGY ATTITUDE SURVEY

1. Do you believe there is an energy shortage? ___yes ___no ___don't know

2. Do you believe you have been given a realistic picture of the energy situation facing the United States? ___yes ___no ___don't know

3. Do you believe most Americans are energy "wasters"?
___yes ___no ___don't know

4. Do you believe most Americans are energy "conservers"?
___yes ___no ___don't know

5. Do you believe Americans are "spoiled", self-indulgent and reluctant to take responsibility for the future? ___yes ___no ___don't know

6. Do you believe it is the responsibility of every U.S. citizen to conserve energy voluntarily? ___yes ___no ___don't know

7. Do you believe Americans will conserve energy only when government controls are imposed? ___yes ___no ___don't know

8. Would you be willing to reduce your standard of living to conserve energy? ___yes ___no ___don't know

9. Do you believe you as an individual can make an impact on energy consumption? ___yes ___no ___don't know

10. Would you conserve energy to save money? ___yes ___no ___don't know

11. Do you think the money saved is worth the inconvenience of conserving energy? ___yes ___no ___don't know

12. Do you think the energy saved is worth the inconvenience of conserving energy? ___yes ___no ___don't know

13. Do you feel technology will "bail us out" of the energy shortage?

___yes ___no ___don't know

14. Do you feel you have any input or participation in the energy usage decisions made by your family? ___yes ___no ___don't know

15. Are you going to do something to save energy? ___yes ___no ___don't know

ENERGY ATTITUDE SURVEY

1. Do you believe there is an energy shortage? __yes __no __don't know

2. Do you believe you have been given a realistic picture of the energy situation facing the United States? __yes __no __don't know

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13. Do you feel technology will "bail us out" of the energy shortage?

__yes __no __don't know

14. Do you feel you have any input or participation in the energy usage decisions made by your family? __yes __no __don't know

15. Are you going to do something to save energy? __yes __no __don't know

COSMIC COOKER

A learning expedition

This experience may be adapted for a wide range of grade levels; rely on your students' imaginations for additional activities. Efficiency can be tested with a thermometer, and grades can be given accordingly.

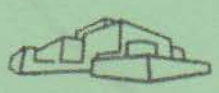
Introduce solar energy by talking about its role in the development of fossil fuels, photosynthesis, and uses today.

Students can be divided into teams and graph, at various times during the day, temperatures reached in 5-, 10-, and 15-minute intervals. Efficiency lost or gained by adding more than one hot dog and changing reflector materials can also be checked.

Cosmic Cooker Plans

1. With the use of the pattern on the back of this sheet, copy two sectors onto a piece of ¼" or thicker cardboard and cut out. Voilà! The corners of your Cosmic Cooker creation can be considered complete.
2. Cut, chew, or chisel from a piece of poster board (2- or 3-ply) a rectangle 13½" by 8½" and fold, spindle, or mutilate it (if all else fails, tape it) to the sides of your super sunbaker of succulent sustenance.
3. Obtain a box that can house the above collector. One side of the box should be about 8-9 inches in length. Cut the top and one 8-9 inch side out and place the collector in the box, attaching with small bolts, nuts, and washers to hole C on sectors.
4. Rip off a coathanger from someplace and sit on it or stomp it until it's straight. Now steel-wool the skewer until all the paint is off. You will, when ready to cook, stick this through Hole A on your sectors.
5. Glue a piece of aluminum foil inside the concave aspect of the collector, with the bright side out. It should be noted that 3-ply poster board can be bought with reflective material on it. This works better than aluminum foil.

Take your skewer and stick it first through a sector, then through your defrosted dog, and then through the other sector (Hole A) Now wrap your dog or dogs with solar paper, black side out, and turn on the sun. To focus the cooker, look at the back side of the solar paper; when the cooker is in focus, the sun's rays will light up the back side of the hot dog.

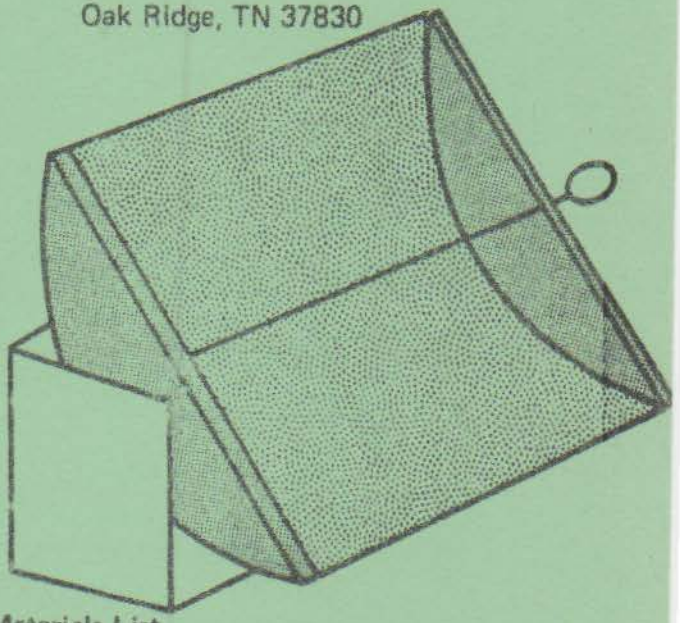


The Science Education Resource Center is part of the American Museum of Atomic Energy in Oak Ridge, TN. The museum is operated for the Energy Research and Development Administration by Oak Ridge Associated Universities, which is a private, nonprofit research and education association of colleges and universities.

Suppliers (in case you would like to replicate the kit)

Item	Supplie
Cardboard sectors	Most sto
Coat hangers	"
Reflector board or poster board	"
Tape	"
Scissors	"
Aluminum foil	"
Bolts	"
Boxes	"
Glue	"
Solar paper	A

A The Discovery Shop
American Museum of Atomic Energy
P. O. Box 117
Oak Ridge, TN 37830



Materials List

[ ] Cardboard box
[ ] Coat hanger
[ ] Tape, masking
[ ] Tape, double-stick
[ ] Small piece ¼" cardboard
[ ] Aluminum foil
[ ] One piece of 13½" by 8½" poster board (3-ply)
[ ] Solar foil
[ ] Hot dog
[ ] 2 bolts, nuts, 4 washers

A
B

RESIDENTIAL ENERGY CHECKLIST

House: The Shell	yes	no
1. Are plants properly located around the house to provide a break against wind and shade against unwanted sun?		
2. Are drapes and furniture located so they do not obstruct heating, air-conditioning or ventilation?		
3. Are draperies insulated?		
4. Do draperies fit snugly around the window?		
5. Are exterior house doors closed quickly after use?		
6. Are lights and appliances turned off after use?		
7. Do you have storm windows and doors?		
8. Are all doors and windows properly caulked and weatherstripped?		
9. Are draperies and shades closed at night and on cloudy, windy days during the heating season?		
10. Are draperies opened to admit sunlight on sunny days in the heating season?		
11. Are draperies and shades closed on sunny days during the cooling season?		
12. Is the attic ventilated?		
13. Is the attic insulated to 6-8"?		
14. Are the walls insulated?		
15. Do floors exposed to unheated or cooled air have from 2-3½" of insulation?		
16. Is the fireplace damper closed when not in use?		
17. Is the den, gameroom or family room oriented to the south?		
18. Is the house shaded from the western sun?		

	yes	no
19. Does your home have window area equivalent to 10% or less of its square footage?		
20. Is your home sealed from drafts? Is it free from cracks and holes?		
21. Does your home have fluorescent lighting where appropriate?		
22. Does your home have wall-to-wall carpeting?		
23. Do all windows have drapery, shades, blinds, shutters or other covering?		
Environmental Control		
24. Are ducts, radiators or air-conditioners closed off in unused rooms or closets?		
25. Are hot water pipes insulated in unheated and uncooled spaces?		
26. Are air ducts insulated in unheated and uncooled spaces?		
27. Is the thermostat set at 68°F or below during the heating season?		
28. Is the thermostat set at 78°F or above during the cooling season?		
29. Are heating and cooling filters clean?		
30. Is the thermostat turned back at night?		
31. Are windows and doors tightly closed while mechanically heating or cooling?		
32. Is an attic fan used in the summer?		
33. Do thermostats indicate correct temperature settings?		
34. Is an outside air-conditioning unit located on the shady (north) side of the house?		
35. Is the water heater insulated?		
36. Is the water heater temperature setting at 140°F or less?		

	yes	no
37. Is the air-conditioning unit properly sized for your needs?		
38. Do you have a heat pump?		
39. Do you use natural ventilation as much as possible?		
40. Are radiators and other heating or cooling equipment clean and dust free?		
41. Is the water heater located in a heated space?		
Housing Selection		
42. If you live in an apartment, is it an "inside" apartment?		
43. If you live in a mobile home, does it have a "skirt"?		
44. If you live in an older home, have its plumbing, wiring, insulation and chimneys been checked by "experts"?		
Food		
45. Is the frost on the refrigerator and freezer less than ¼ inch thick?		
46. Is the refrigerator set at 40°F?		
47. Is the freezer set at 10°F?		
48. Are gaskets around refrigerators and freezers tight?		
49. Is the oven used to bake more than one food at a time?		
50. Is the gasket around ovens tight?		
51. Are frozen foods thawed completely before cooking?		
52. Is the cooking range turned off immediately after use?		

	yes	no
53. Are dishes washed only when there is a full load?		
54. Are dishes allowed to air dry?		
55. Are appliances clean and dust free (particularly cooling coils)?		
56. Is the oven never used as a dryer or heater?		
57. Are flat bottom pots and pans used?		
58. Is a timer used to avoid over-cooking?		
59. Are pots covered during cooking?		
60. Is as little water used as possible during cooking?		
61. Is the heated dry cycle on the dishwasher not used?		
Clothing		
62. Does your family dress warmer in cool weather to avoid mechanical heating?		
63. Does your family dress cooler in warm weather to avoid mechanical cooling?		
64. Are clothes washed only when there is a full load?		
65. When washing is cold or warm water used when possible?		
66. Are clothes line dried when possible?		
67. Are most of your family's clothes wash-and-wear, permanent press to avoid dry cleaning and ironing?		
68. Are clothes always rinsed with cold water?		
69. Is the washer located near the water heater?		
70. Is the dryer lint screen cleaned after each load?		

Personal Care	yes	no
71. Do the members of your family take short showers or use only small amounts of water for tub baths?		
72. Are all water faucets repaired and not leaking?		
73. For washing, shaving or make-up is the lavatory filled rather than allowing water to run?		
Entertainment		
74. Are entertainment devices turned off when not in use?		
75. Do members of your family try to entertain themselves rather than rely on devices?		

--If you answered with 65 or more yes's, you are truly an energy conserver and will make a good conservation advocate.

--If you answered with 55 to 65 yes's, you are energy conscious but lack will-power or drive.

--If you answered with 45 to 54 yes's, you are wasting energy but with minor changes could make a conserver.

--If you answered with 35 to 44 yes's, you are an energy waster and should make an all-out effort to reform!

--If you answered with less than 35 yes's, you are making an effort to waste energy and should consider the long range and immediate effects!!

Suggestions:

1. Distribute these checklists school-wide.
2. Try a before and after approach to using the checklist. Check before your conserving effort and after.
3. Survey students to see if their families are generally conservative or not.

that such a system will have an efficiency of approximately 95 percent and a lifetime of 30-40 years or more. It will also be approximately 1,000 times smaller than a pumped storage system.[113] It is estimated that a superflywheel system storing 10,000 kilowatt-hours of mechanical energy and having a power rating of 3,000 kilowatts will be much less costly than a pumped storage system.[114]

The superflywheel should be applicable to energy storage suitable for generating plants but also in a size suitable for use in automobiles.[115] Also, the superflywheel could provide the means to store solar and wind power.[116]

RENEWABLE AND NONRENEWABLE ENERGY RESOURCES: THEIR FUTURE AVAILABILITY

All energy resources belong to one of two groups--renewable or nonrenewable resources. Nondepletable energy resources are *renewable;* for example, the sun is a renewable resource, as is water. In 1974, only six percent of all energy resources consumed were renewable.

Depletable energy resources are *nonrenewable.* Fossil fuels--coal, oil, and gas--are nonrenewable because they were produced over millions of years by vegetation under pressure in the earth's crust and heated by the sun. Uranium, another important energy resource, is also nonrenewable. In 1974, 94 percent of all energy resources consumed were nonrenewable; in other words, America's high-energy society is based upon a finite, dwindling supply of energy.

Renewable Energy Resources

Solar. By 1973 only a few dozen U.S. homes had been constructed with solar heating systems; but by the year 2000 solar heating and cooling could satisfy perhaps half the needs of all new residential and commercial buildings. Presently there are some very promising approaches to using solar energy for low temperature needs such as space and water heating, but the cost is still relatively high ($10 to $12 per square foot for solar panels) and functional storage systems must be developed to operate in conjunction with the solar devices. If solar equipment (lenses, mirrors, panels, and other devices used to concentrate the energy of the sun) can be made cheaply enough, we could produce electricity either by a thermal cycle (making steam and driving a turbine) or by direct conversion using solar cells. The thermal cycle alternative is much closer to practical implementation, but is still several times as expensive as present methods of energy generation.

Geothermal. Large amounts of geothermal energy (heat in the form of steam, such as that found in geysers) is present in the earth's crust, but it is possible to tap these resources only in limited locations.

Thus far, development and exploration in the U.S. has been conducted mainly in the West (California) because the most promising sites are found there. Experts estimate, however, that over the next 25 years as much as 25,000 MW will be provided by geothermal plants, where steam from the earth is used to drive turbines which generate electricity. There are, however, a number of disadvantages to using geothermal energy in this manner. Equipment used in the plants tends to corrode quickly because of minerals which dissolve in the hot water. These same minerals can create some environmental problems in the form of ground water contamination, waste salts, and air pollution (including escaping hydrogen sulfide which smells like rotten eggs). Finally, geothermal steam is not very hot, and so is an inefficient means of producing electricity (it also produces a lot of "waste heat").

Wind. Like geothermal energy, practical wind energy is found only in certain locations, mostly in the Midwest and Northeast. Even there, it is variable and must be accompanied by storage devices or used only for special purposes, such as pumping water for stock ponds. At present, however, wind power generators are being tested in Northern Europe, Russia, and the U.S. A 100 KW wind turbine generator has gone into operation recently at NASA's Plumb Brook Station at Sundusky, Ohio, sponsored by ERDA. Unless research designers prove otherwise, many windmills are needed to obtain a reasonable quantity of energy (thousands would be needed to equal the output of a single modern electric generating plant).

Tides. Although suggestions have been made to harness the energy in tides, the total amount of tidal energy potential ($2 \cdot 10^6$ MW) would make a negligible impact on the world's energy supply. Furthermore, suitable locations are not where the demand is and severe environmental problems could be caused by massive movements of water in and out of coastal areas. Other disadvantages are visual pollution if the generating facilities were in a resort area, corrosion of equipment by salt water, and high capital costs.

Wood. Wood is still an important energy source in "third world" nations and can provide a great deal of power for short periods. Wood could continue to be used as a renewable fuel if it were grown on "plantations" and then burned to produce electricity. The obvious disadvantage, however, is the competition for land use by the agricultural sector.

Hydro (Water). Most hydroelectric potential in the United States is already being used and environmental problems will probably prevent the development of additional sites. At the end of 1970, the installed hydroelectric capacity (both conventional and pumped) was 56,000 MW. By the year 2000, it is estimated that it will provide 125,000MW of power, but only 10 percent of the nation's electricity demand. Much of the capacity in 2000 will be used for pumped storage systems which will

use the spare capacity of "base load" electric plants (for example, in the middle of the night) to provide power during periods of peak demand the next day. Water will be pumped uphill for storage, and power will be produced later when it is released downhill.

Fusion. Although the key concepts and technologies which will unlock the intricacies of fusion are not yet known, fusion remains a major hope for significant quantities of power. Once developed, fusion could provide a long-range solution to the world's energy shortages because a nearly inexhaustible supply of deuterium (the fuel necessary to produce fusion power) is found in water.

Refuse. Using our solid wastes to supply part of our electrical demand is an idea which appeals to many people and, indeed, some small plants are already in operation or under construction which can produce electricity from solid wastes. One such plant in St. Louis burns approximately 300 tons of municipal waste per day to generate 12.5 MW of electricity. But even if we took full advantage of the energy contained in *all* refuse, less than 10 percent of our energy needs would be met.

Nonrenewable Energy Resources

Coal. Coal is the only nonrenewable energy resource which still exists in any abundance. Proved U.S. reserves are estimated to be 400 billion tons; possible resources are estimated as high as 3200 billion tons. This adds up to as much as 200 years' supply of coal at the current energy use rate. Coal is presently used to convert water to electricity or to make steam for industry, in the future if may be converted directly to gas or oil. Coal creates many environmental problems, however. Because it is a "dirty" fuel, it causes air pollution (the higher the sulphur content, the more pollution; western coal has less sulphur, but more ash, than eastern coal). Strip-mining--the easiest and least dangerous method of coal mining--causes erosion and leaches wastes into streams and watersheds. Companies which strip-mine for coal (about half of all U.S. coal is strip-mined) are being pressured to reclaim stripped land at high cost.

Natural Gas. The proved reserves of natural gas are close to 200 trillion cubic feet. At current energy use rates, this supply would last only nine more years. Estimates of possible additional resources range from 450 to 2,000 trillion cubic feet--a current use rate range of 20 to 100 years. At the present time, natural gas is our least expensive fossil fuel because of price controls that make it artifically cheap. In the future, however, the price of natural gas will become much higher, necessitating many current users to switch to some other fuel. There will undoubtedly be opposition to such a switch since natural gas is the cleanest of the three fossil fuels and is in great demand for space heating. Though extremely controversial, it has been suggested that atomic detonations be

used to release large amounts of natural gas which may be locked in oil fields.

Oil. The amount of oil which remains in the U.S. and offshore is unknown, though proved reserves (including Alaska) are estimated to be 45 billion barrels (BBL) and estimates of possible reserves are in the neighborhood average 89 BBL. Like that of natural gas, the price of extracting petroleum from U.S. oil fields may become so high that we will change our present use patterns (6.19 BBL in 1973). Costs will increase because most of the easy-to-get oil has been consumed and new, harder-to-get sources requiring more complicated technologies will have to be tapped. Exploration for additional oil reserves centers on sites under as much as 800 feet of ocean or as far as 25,000 feet underground. Other large reserves of oil are trapped in fine-grained rock called shale. Useful fuel can be extracted from oil shale, but the net energy produced may be small, the process expensive (perhaps twice the present cost), and the environmental problems significant (large amounts of water are needed for extracting processes).

Uranium. Uranium, as a fuel for nuclear reactors, is a controversial energy source. It is highly favored by some groups because the potential energy of a given quantity of uranium is several million times greater than the energy available from an equal quantity of any one of the three fossil fuels. Mining uranium is a great deal more difficult than fossil fuels, however. Even the richest uranium ore may contain only a fraction of one percent of uranium. Because uranium ore is not pure and the costs of extraction vary, the amount of current reserves are hard to estimate. It has been suggested, though, that we only have 30 years worth left of U^{235}--the uranium necessary to produce fission reactions in conventional nuclear power plants. The drawbacks to fission as it is presently used to produce electricity are the radioactive wastes and safety concerns. These objections may be overcome with the possible future development of the breeder reactor. At the present time, breeder technology is not well-established; costs of development will be high, and it is known that the waste product--plutonium--is extremely toxic. If breeders can be successfully developed and these obstacles overcome, the effective amount of fissionable material (the plentiful U^{238} after being converted to Pu^{239}) is tremendously increased, making our current energy reserves of uranium large enough to fulfill our energy needs for thousands of years.

INSTRUCTIONS FOR THE CREW OF OUR "SPACESHIP EARTH"

Resolve now to change your life style to put less strain on your environment. Make conservation a way of life. Here are some suggestions:

1. Save water. Don't leave household faucets running unnecessarily while brushing teeth, cleaning vegetables, etc. Fix leaking faucets and toilets. Don't overwater your lawn, garden, or crops. Water in the evening to cut evaporation loss. Conserve water as if there were a shortage--it's coming!

2. Save electricity. Turn off lights, applicances, radios, etc. when not in use. Turn the hot water heater thermostat down to 130-140 F. Turn the air conditioner thermostat up to 80 F or better yet turn it off and turn on a fan.

3. Reduce air pollution. Use non-leaded gasoline--most cars will run fine with it. Keep your car tuned and don't let it idle too long. Walk or bicycle when possible--it's good for the environment and your heart. Form car pools--its good for the environment and your budget.

4. Buy beverages in returnable glass containers only. They are used an average of 20 times instead of once for the no-return bottle or can.

5. Don't hesitate to pick up other people's litter. Politely tell a litterbug, "You dropped something".

6. Don't waste paper. It comes from trees. Use both sides of paper. Turn in newspapers for recycling. Take your old paper sacks to the grocery store and use them again.

7. Protect endangered wildlife. Do not purchase products which contain the furs skins, or feathers of animals or birds which are protected or rare.

8. Reduce size of families. Zero population growth can be achieved through a maximum of two children per couple. Whatever your cause, it's a lost cause unless we control world population.

9. Help save natural areas. Wild places are disappearing fast. Make an inventory of those that remain in your area, then work to preserve them. Remember the Alaska National Parks Proposals--support them.

10. Recycle everything. All cans, all bottles, all paper, all metals can be used again--find out where to take them for recycling. Compost all garbagge--it's good for your garden. Recycle clothing and cloth through charitable organizations.

Join a conservation organization. Our thanks to the Florida Wildlife Sanctuary for many of these conservation suggestions.

A Partial Listing of Energy Information Sources:

US Energy Research and Development Admin.
PO Box 62
Oak Ridge, Tn 37830

Write for an order form for information booklets on such topics as solar and nuclear energy, wind power, radioactive waste storage, solar cookers....the home economics teacher's book,"Energy Conservation in the Home", is also from ERDA.

National Solar Heating and Cooling
Information Center
PO Box 1607,
Rockville, MD 20850
Tel: 800-523-2929 toll free

This Information Center was established by ERDA and the US Dept. of Housing and Urban Development (HUD) to answer your questions about applications in solar energy homebuilding. They welcome inquiries from homeowners, builders, contractors, com munity planners--anyone concerned with housing. Ask for HUD's booklet,"Solar Energy and Your Home".

Federal Energy Administration (FEA)
Public Affairs--Region IV
1655 Peachtree ST, NE
Atlanta, GA 30309

These folks have more "Energy Ant Activities" booklets and Solar Fact Sheets as well as other energy information.

Florida Solar Energy Center
300 State Road 401
Cape Canaveral, FL 32920
Tel: 305-783-0300

Solar Water Heating: A Question and Answer Primer; The Solar Collector Newsletter; A Short Guide to the Florida Solar Energy Center; and other publications. The FSEC provides information services, research and development, education, publications library services, testing and standards, and technical assistance.

CINQUAIN

1. _____

2. _____ _____

3. _____ _____ _____

4. _____ _____ _____ _____

5. _____

1. _____

2. _____ _____

3. _____ _____ _____

4. _____ _____ _____ _____

5. _____

HOW TO WRITE POETRY USING THE CINQUAIN STYLE

1. Use one word to name the subject you are writing about.
2. Use two words to describe #1.
3. Use three words about what #1 is doing.
4. Use four words to tell how you feel about #1.
5. Use a word that means the same as #1.

CINQUAIN

1. _____

2. _____ _____

3. _____ _____ _____

4. _____ _____ _____ _____

5. _____

1. _____

2. _____ _____

3. _____ _____ _____

4. _____ _____ _____ _____

5. _____

HOW TO WRITE POETRY USING THE CINQUAIN STYLE

1. Use one word to name the subject you are writing about.
2. Use two words to describe #1.
3. Use three words about what #1 is doing.
4. Use four words to tell how you feel about #1.
5. Use a word that means the same as #1.

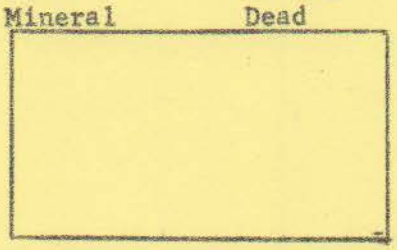
Student's Names _____

MINI WORLD

List all the different items you can find inside your hanger. List one item per square. If you cannot name the item, then in a few words describe it. Circle whether the item is an animal, a plant, or a mineral and if it is living or dead.

Animal Plant Mineral Living Dead

Animal Plant Mineral Living Dead



Animal Plant Mineral Living Dead

Animal Plant Mineral Living Dead

Animal Plant Mineral Living Dead

Animal Plant Mineral Living Dead

Animal Plant Mineral Living Dead

Animal Plant Mineral Living Dead

Animal Plant Mineral Living Dead

Connect items that need each other with lines. Many items will have several "need" lines.

Student's Name _____

Name _____

MINI WORLD

List all the different items you can find inside your bumper. List one item per square. If you cannot name the item, then in a few words describe it. Circle whether the item is an animal, a plant, or a mineral and if it is living or dead.

Animal / Plant / Mineral	Living / Dead	Animal / Plant / Mineral	Living / Dead	Animal / Plant / Mineral	Living / Dead

Animal / Plant / Mineral	Living / Dead	Animal / Plant / Mineral	Living / Dead	Animal / Plant / Mineral	Living / Dead

Animal / Plant / Mineral	Living / Dead	Animal / Plant / Mineral	Living / Dead	Animal / Plant / Mineral	Living / Dead

Connect items that need each other with lines. Many items will have several "need" lines.

Student's Names _____

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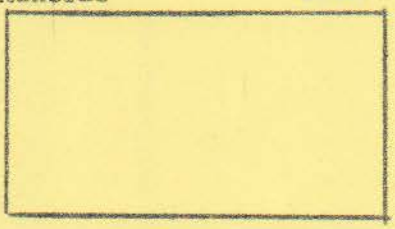
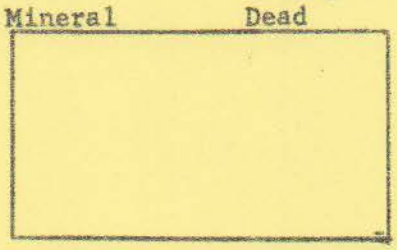
List all the different items you can find inside your hanger. List one item per square. If you cannot name the item, then in a few words describe it. Circle whether the item is an animal, a plant, or a mineral and if it is living or dead.

Animal Plant Mineral Living Dead



Animal Plant Mineral Living Dead



Animal Plant Mineral Living Dead

Animal Plant Mineral Living Dead

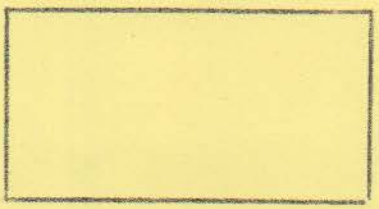
Animal Plant Mineral Living Dead

Animal Plant Mineral Living Dead

Animal Plant Mineral Living Dead

Animal Plant Mineral Living Dead

Animal Plant Mineral Living Dead



Connect items that need each other with lines. Many items will have several "need" lines.

Student's
Names

MIND WORLD

List all the different items you can find inside your bumper. List one item per square. If you cannot name the item, then in a few words describe it. Circle whether the item is an animal, a plant, or a mineral and if it is living or dead.

Animal Plant Mineral	Living Dead	Animal Plant Mineral	Living Dead	Animal Plant Mineral	Living Dead

Animal Plant Mineral	Living Dead	Animal Plant Mineral	Living Dead	Animal Plant Mineral	Living Dead

Animal Plant Mineral	Living Dead	Animal Plant Mineral	Living Dead	Animal Plant Mineral	Living Dead

Connect items that need each other with lines. Many items will have several "need" lines.

Student's Names ______________ ______________

MINI WORLD

List all the different items you can find inside your hanger. List one item per square. If you cannot name the item, then in a few words describe it. Circle whether the item is an animal, a plant, or a mineral and if it is living or dead.

Animal Plant — Living Mineral — Dead	Animal Plant — Living Mineral — Dead	Animal Plant — Living Mineral — Dead
Animal Plant — Living Mineral — Dead	Animal Plant — Living Mineral — Dead	Animal Plant — Living Mineral — Dead
Animal Plant — Living Mineral — Dead	Animal — Living Plant — Dead Mineral	Animal Plant — Living Mineral — Dead

Connect items that need each other with lines. Many items will have several "need" lines.

Student's
Name _____

_____

MIND MODEL

List all the different items you can find inside your Manger. Like one item per square. If you cannot name the item, then in a few words describe it. Circle whether the item is an animal, a plant, or a mineral and if it is living or dead.

Animal Plant Mineral	Living Dead	Animal Plant Mineral	Living Dead	Animal Plant Mineral	Living Dead

Animal Plant Mineral	Living Dead	Animal Plant Mineral	Living Dead	Animal Plant Mineral	Living Dead

Animal Plant Mineral	Living Dead	Animal Plant Mineral	Living Dead	Animal Plant Mineral	Living Dead

Compare items that need each other with lines. Many items will have several "need" lines.

Student's Names ____________
____

MINI WORLD

List all the different items you can find inside your hanger. List one item per square. If you cannot name the item, then in a few words describe it. Circle whether the item is an animal, a plant, or a mineral and if it is living or dead.

Animal Plant Living Mineral Dead	Animal Plant Living Mineral Dead	Animal Plant Living Mineral Dead
Animal Plant Living Mineral Dead	Animal Plant Living Mineral Dead	Animal Plant Living Mineral Dead
Animal Plant Living Mineral Dead	Animal Living Plant Dead Mineral	Animal Plant Living Mineral Dead

Connect items that need each other with lines. Many items will have several "need" lines.

Student's
Name

MINI WORLD

List all the different items you can find inside your hamper. List one item per square. If you cannot name the item, then in a few words describe it. Circle whether the item is an animal, a plant, or a mineral and if it is living or dead.

Animal Plant Mineral Living Dead	Animal Plant Mineral Living Dead	Animal Plant Mineral Living Dead
Animal Plant Mineral Living Dead	Animal Plant Mineral Living Dead	Animal Plant Mineral Living Dead
Animal Plant Mineral Living Dead	Animal Plant Mineral Living Dead	Animal Plant Mineral Living Dead

Connect items that need each other with lines. Many items will have several "need" lines.