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ABSTRACT

This document is a guide for teachers and community resource personnel interested in developing an environmental education program. The book is divided into seven parts: (1) Process and Problem Solving Approach to Learning; (2) Lesson Plans for Environmental Investigations; (3) Simulations; (4) Developing Environmental Investigations; (5) Group Involvement Techniques; (6) Environmental Education Action Plan; and (7) Miscellaneous Activities. The environmental investigations include topics such as water quality, ecological relationships, and land use, and are designed for students in grades K-12. Guidelines are included for the preparation, execution, and post-discussion of these investigations. Simulations concerned with land use and community action are included along with guidelines for developing further simulations. The action plan section gives directives for organizing an environmental education committee and school curriculum. (MA)

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ENVIRONMENTAL EDUCATION FOR TEACHERS AND RESOURCE PEOPLE

United States Department of Agriculture Forest Service

U S DEPARTMENT OF HEALTH EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

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TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC) AND USERS OF THE ERIC SYSTEM"

023 051

WHY ENVIRONMENTAL EDUCATION?

Within the past fifty years, the United States has become a predominantly urban nation, both in thought and in physical character. Large and middle-sized communities, many within complex urban regions, have evolved where over seventy per cent of this country's population resides on one and one-half per cent of the nation's land surface. By 1980, eight out of ten Americans will probably live in an urban environment. Consequently, the independent rural-oriented living that once characterized this country's social and political heritage is no longer a dominating influence in the lives of most Americans.

In rural surroundings, direct daily contact with the basic natural resources was prevalent, especially within man's immediate environment. As man became progessively urbanized, his intimate association and interaction with natural resources diminished and, with it his awareness of his dependency on them. Yet, it is imperative that man, wherever he lives, comprehend that his welfare is dependent upon the "proper" management and use of these resources.

Man should also have an awareness and understanding of his community and its associated problems. Our communities are being plagued with problems such as: lack of comprehensive environmental planning; indiscriminate use of pesticides; community blight; air and water pollution; traffic congestion; and the lack of institutional arrangements needed to cope effectively with environmental problems. While these problems are legitimate concerns of community governmental officials and planners, the responsibility for their solution rests, to a large extent, with citizens.

To an increasing extent citizens are being asked to make decisions that affect (directly and indirectly) their environment. Specifically, citizens make these decisions as they cast votes on community issues; as they elect representatives to policy-making bodies; as they directly act upon the environment itself. Citizens can be effective in influencing sound policy in other ways. They can ask informed questions, at the proper time, of the right people. They can serve on advisory and policy-making committees. They can support sound legislation directed at resolving environmental problems. To perform these tasks effectively, it is vital that the citizenry be knowledgeable concerning their biophysical environment and associated problems, aware of how they can help solve these problems, and motivated to work toward effective solutions.

Most current programs in conservation education are oriented primarily to basic resources; they do not focus on the community environment and its associated problems. Furthermore, few programs emphasize the role of the citizen in working, both individually and collectively, toward the solution of problems that affect our well being.

There is a vital need for an educational approach that effectively educates man regarding his relationship to the total environment.

The Supreme Court decision regarding the one-man, one-vote concept, that has enabled the increasing urban majority to acquire greater powers in decision-making, makes it imperative that programs developed for urbanites be designed with them in mind. It is important to assist each individual, whether urbanite or ruralite, to obtain a fuller understanding of the environment, problems that confront it, the interrelationship between the community and surrounding land, and opportunities for the individual to be effective in working toward the solution of environmental problems.

This new approach, designed to reach citizens of all ages, it called "environmental education." We define it in this way.

Environmental education is aimed at producing a citizenry that is knowledgeable concerning the biophysical environment and its associated problems, aware of how to help solve these problems, and motivated to work toward their solution.

The major objectives of environmental education are to help individuals acquire:

1. A clear understanding that man is an inseparable part of a system, consisting of man, culture, and the biophysical environment, and that man has the ability to alter the interrelationships of this system.

The principal feature of the philosophy of environmental education is that man is an intregal part of a system from which he cannot be separated. Specifically, this system consists of three components, man, culture, and the biophysical environment. Culture, in this context, incorporates organizational strategies, technological processes, and social arrangements (political, legal, managerial, educational, etc.) through which man interacts with the biophysical environment. The biophysical environment designates both the natural and man-made components of the environment.

The fundamental relationship between the integral parts of the system is man's interaction through culture on the biophysical environment to produce or obtain the goods and services that he needs.

Within the system, man has the ability either to strengthen, weaken, or maintain the interrelationships between the system's major components. The ultimate goal of environmental education is the development and maintenance of a high quality system in which man interacts through culture on the biophysical environment to advance human welfare.

2. A broad understanding of the biophysical environment, both natural and man-made, and its role in contemporary society.

The existence of any civilization is dependent upon man's use of natural resources. Resources are defined as those parts of the biophysical environment which are appraised by man as being immediately or potentially useful to him.

A basic understanding of natural resources ideally includes their characteristics, distribution, status, interrelationships, and their present and potential uses. Natural resources serve man in many ways, whether in a relatively undistrubed condition or in the highly altered utilitarian forms of the man-made biophysical environment. A strong understanding of how these resources are used requires knowledge of the social, political, economic, technological processes, institutional arrangements, and aesthetic considerations which govern their utilization.

The man-made component of the biophysical environment results from man's use of natural resources. An understanding of this aspect is also essential: it should ideally include familiarity with urban and rural design, including transportation systems, spatial patterns of development, and aesthetic qualities which have a major impact on the functioning of society. Fundamental to these understandings should be the realization that the development of the man-made environment should strive for a high quality system which improves human welfare in relation to the natural environment.

3. A fundamental understanding of the biophysical environmental problems confronting man, how these problems can be solved, and the responsibility of citizens and government to work toward their solution.

Biophysical environmental problems result from the interactions between man, culture and the biophysical environment. Pollution, the inefficient utilization and management of natural resources, the indiscriminate use of pesticides, urban blight, and transportation congestion are just a few biophysical environmental problems. These problems, caused by a complex set of biological, physical and social factors, affect the total environmental system.

Citizens need to understand how to work toward solutions of biophysical environmental problems through laws, public policies, planning, resource management, research, technological developments, and institutional arrangements.

Citizens should realize that the responsibility for solutions to these problems belongs to them and the governments which represent them.

4. Attitudes of concern for the quality of the biophysical environment which will motivate citizens to participate in biophysical environmental problem-solving.

The word "attitude" used in this context implies more than simply the knowledge of a body of factual information.

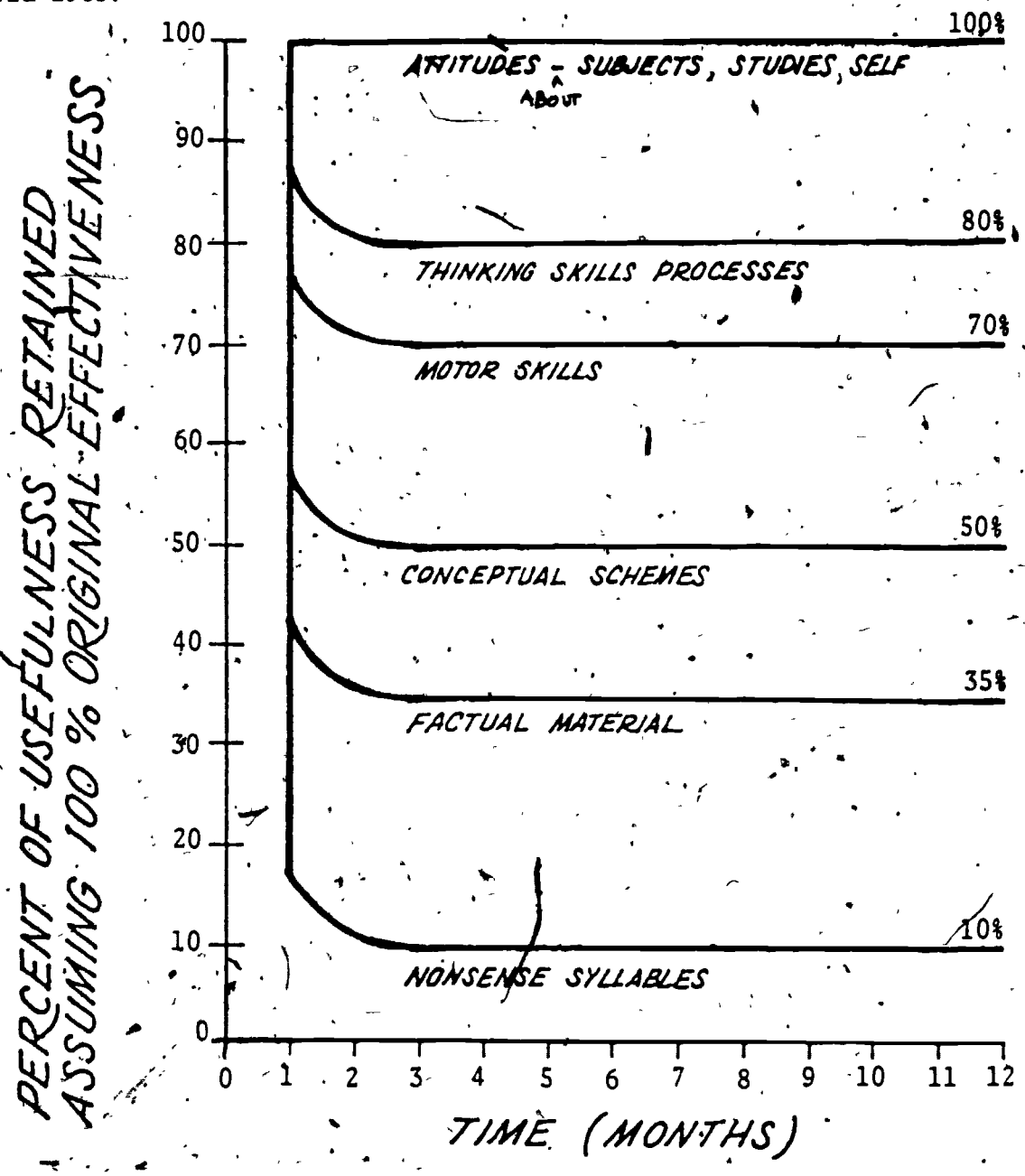
Instead, it implies a combination of factual knowledge and motivating emotional concern which result in a tendency to act. Further, it is understood that clusters of attitudes about similar environmental conditions will motivate individuals to express their attitudes.

Therefore, for environmental education to achieve its greatest impact, it must: (1) provide factual information which will lead to an understanding of the total biophysical environment; (2) develop a concern for environmental quality which will motivate citizens to work toward solutions to biophysical environmental problems; and (3) inform citizens as to how they can play an effective role in achieving the goals derived from their attitudes.

The University of Michigan
School of Natural Resources

Survival Values in Learning

Used in the Higher Level Thinking Ability Course - N.W.E.R.L. - as an interpretation from Educational Psychology, Cronbach Harcourt Brace & World 1963.



This chart shows the retention rate of different categories of learning. In small groups discuss and answer the following questions.

What does this chart say about the retention of learning?

What are the implications of this chart to the way we plan learning experiences?

SAFETY IN A NATURAL ENVIRONMENT

Prior to going into study areas:

1. Discuss fire prevention with group:

   a. Safe smoking. Stop other activities; break matches; clear small area to mineral soil and grind cigarette butts and pipe heels into cold soil.

   b. Playing with matches. Children younger than 12 are especially hazardous with matches.

   c. Building camp fires or warming fires. Start fires in cleared areas only, under safe weather conditions. Extinguish fires by mixing water and dirt with coals of the fire until the mixture is cold to the touch. Use extra care in extinguishing charcoal.

   d. Keeping vehicles on roads or trails. Dry grass or needles can be ignited by vehicle exhausts.

2. Know the location of the nearest telephone or Ranger Station to report a fire or any emergency. Use extreme care with fire in buildings - fire department not nearby.

3. Have at least a shovel and water bucket available in case of fire; know location of water.

4. Other safety considerations

   a. Proper clothing, e.g., boots and coats.
   b. First aid kit; if in snake country, snakebite kit.
   c. Matches, always in waterproof container.
   d. Pocketknife.
   e. Extra food supply
   f. Itinerary of travel and hour of return.

5. Emergencies

   a. If lost, keep calm - conserve your strength; select sheltered spot and prepare camp and firewood before dark.

   b. Avoid poison plants, insects, snakes, and wild animals.

   c. Avoid climbing on cliffs or entering caves or old mine shafts.

   d. Lightning storms! Do not sit or stand under large trees or on ridge tops.

an introduction to

INVESTIGATING YOUR ENVIRONMENT SERIES

Living in an environment becomes a little easier if we understand what makes up that environment and how our actions affect it. The processes and techniques contained in these lesson plans will enable people to actively examine different components of the environment and help them to understand the relationships among these components.

The investigations encourage participants to observe their surroundings and to collect, record, and interpret data. Facts and figures are collected as a means toward gaining a deeper understanding, not as an end in themselves. The questions and discussions are designed to elicit maximum response and involvement from the participants and to eliminate lecturing and "show-and-tell" activities. Each lesson plan provides a framework within which succeeding activities and discussions build on what has gone before, leading the participants to an understanding of environmental relationships. A knowledge of these relationships provides the basis for better comprehension of environmental problems and their possible solutions.

The various processes and techniques can be used to investigate many aspects of the environment. However, some changes in specific activities may be necessary when applying these lesson plans in different locations or situations.

Each lesson plan has six components:

1. Suggestions for "setting the stage";
2. Individual or group activities;
3. Task cards for some activities;
4. Charts and tables to be used in data interpretation;
5. Suggested questions, discussions, and summaries;
6. A statement of anticipated behavioral outcomes.

The following activity sequence patterns are examples of those found in the lesson plans:

1. Pre-investigation discussion-problem statement-data collection and recording-interpretation-post-activity discussion-summary-applications.
2. Problem statement-data collection and recording-interpretation-alternative solutions-implications-applications.
3. Problem or situation statement-target group identification-role playing-interpretation-alternative solutions-implications-applications.

Discussion questions, as shown in the lesson plans are designed for each person to contribute to the group's interpretation, understanding and summarization of the subject being investigated. Many of the activity sequences will encourage additional questions and discussion.

The concluding discussion period is one of the most important parts of each investigation. It is designed to:

1. Enable each participant to develop her or his own thoughts regarding the techniques experienced and how these may be applied.
2. Provide opportunities to discuss the implications of various management practices on a particular environment.

Investigating Your Environment Series
U. S. Forest Service
Denver, Colorado -- 1975

Implementing an Investigation

The lesson plans are self-explanatory. However, there are some aspects of the overall process which need to be emphasized.

Preparing for an Investigation

1. Select the site and "dry-run" the investigation on the site.
2. Plan and pace the session so that each activity can be done well.
3. Use the lesson plan as a guide, especially for the questioning and the discussion periods. Once the plan has become familiar do not hesitate to revise it as necessary.
4. If there will not be enough time to do an entire investigation, decide in advance which activities should be omitted. Do not become trapped into moving so quickly that the data is provided the participants rather than allowing them to collect it.
5. Make sure that there is enough equipment and that it is in working order.

Beginning an Investigation

1. Set the stage for what will happen during the session. Refer to the introductory paragraphs in each lesson.
2. Before leaving for the study area, have the participants discuss what effects the investigation itself may have on the environment and possible hazards which may be encountered.
3. Arrange for checking out and returning the equipment. Usually it is best to have one or more participants do this.

During the Investigation

1. Be sure to give clear directions. Do not be reluctant to read or write directions. Experience has shown that ad libbing instructions often changes and confuses the meaning.
2. Listen to what the participants say and accept all their contributions.
3. Refocus on the original question if the discussion goes off on a tangent.
4. Allow adequate time for the final summary and discussion. It may take as much as one-half hour. This discusssion is extrememly important because it concentrates on the application of what was learned during the investigation.
5. When appropriate, discuss how the investigation can be used in classrooms or on schoolgrounds, and especially how environmental studies can be integrated into various subject areas in the school curriculum.
6. Consider using the summary discussion as an evaluation tool.

Finally

Constantly be alert for opportunities to expand, adapt, and improve subsequent investigations.

The ideas and activities presented in these teaching materials will "come to life" only as you try them, modify them, and improve them to fit your own needs, style, and situation.

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The plans were developed with the assistance of educators, students, and resource-agency people. They have been successfully field-tested at environmental education workshops throughout the country.

A LESSON PLAN FOR A PROCESS AND PROBLEM SOLVING APPROACH TO LEARNING

In this session we are concerned with techniques and processes of involving people in problem-solving activities. The success of these activities will be measured by the application of group interaction and problem-solving skill to the environmental investigation that we do later.

We are concerned, then, about how to transfer the process of involving people in environmental investigations.

Since a lot of our work this week will be working in small group problem-solving sessions, we want to start by involving you in a problem-solving exercise.

I. SOLVING A PROBLEM THROUGH GROUP INTERACTION

Questions and Discussion:

*Ask if anyone has played the "6 Bits" problem-solving activity. If so, get them aside and ask them to be observers. Tell them: as someone who has been through the process observe when group begins to work together and why.

1. Have audience arrange themselves in groups of six, or have chairs grouped that way ahead of time.
2. Pass out the "6 bits of information" problem, one bit of information to each person (use problem on page 9).
3. Tell audience that there is a problem to solve, they can tell their group what is on their paper but then must not show it to others.
4. As the problem-solving session progresses:
   a. 5-8 minutes into problem write on the board - Trust
   b. 8-12 minutes into problem write - Visual Display
   c. 12-15 minutes into problem write - Matrix
   d. Say--"If the words above and the magic markers and easel paper just passed out to you can help your group solve the problem, please use them."

TASK A: Identify and solve the problem in the "6 Bits" activity.

Questions and Discussion (After all groups have finished):

1. What kept you from solving the problem to begin with?
2. What helped you to solve the problem later?
3. What were some characteristics of this problem-solving exercise? (List comments from group and discuss.)
*4. Ask for comments from any observers - what went on in the groups? When did they start working as a group?

4. The people who developed the problem-solving exercise feel that it contains elements of involvement that most all groups go through; it also illustrates the way groups work together on common problems.

They hypothesized that the following things would take place during the problem-solving exercise: (Write each item on the board, or have a chart made up with each item listed.)

a. TRUST (will develop). Must trust that the instructor gave you a solvable problem.
Must trust each other.

b. RITUALISTIC LISTENING (will take place).
This is a kind of polite listening - really without caring too much, because the data offered has no relevance at that time.

c. REAL LISTENING (will take place).
When statements become more meaningful.. (Data means something)
When people interrupt and say, "Say that again!"

QUESTION: When in your group did you change from ritualistic listening to real listening?

When real listening occurs, two things will change:
Vision - Participants will begin to vision the listening by...really looking at other people
...constructing a Visual Display (writing data in a common place)
helps make inferences
don't have to listen to everything
Space - Space factors will change
people will usually move closer together
people will sometimes change places, or move around the table.
Noise - Noise level goes up when groups start working together.

5. Using this type of activity at the beginning of a session is important for these reasons. We used it as an ice breaker.

a. The problem could not be solved without the contributions of each person in the group.
b. People feel more committed to a session if they contribute by saying something - the earlier the better.
c. It's easier to talk to each other in a small group than to talk to one instructor in front of a large group.
d. This exercise illustrates that each person in a group brings information and skills that can be used by the entire group to solve common problems. THE PIECES OF PAPER REPRESENTED THE INFORMATION AND SKILLS THAT EACH OF YOU BROUGHT TO THE GROUP.

6. We will be concerned in this workshop with providing ways for each person to contribute knowledge, information, and skills to the solving of common problems. the content and activity itself are not always most important - what is important is the idea that you can use different techniques to get people talking to each other and contributing as a group.

7. NONE OF US IS AS SMART AS ALL OF US. (Try printing this on the board during the problem solving exercise.)

II. OBSERVING AND CLASSIFYING TREE LEAVES

Questions and Discussion

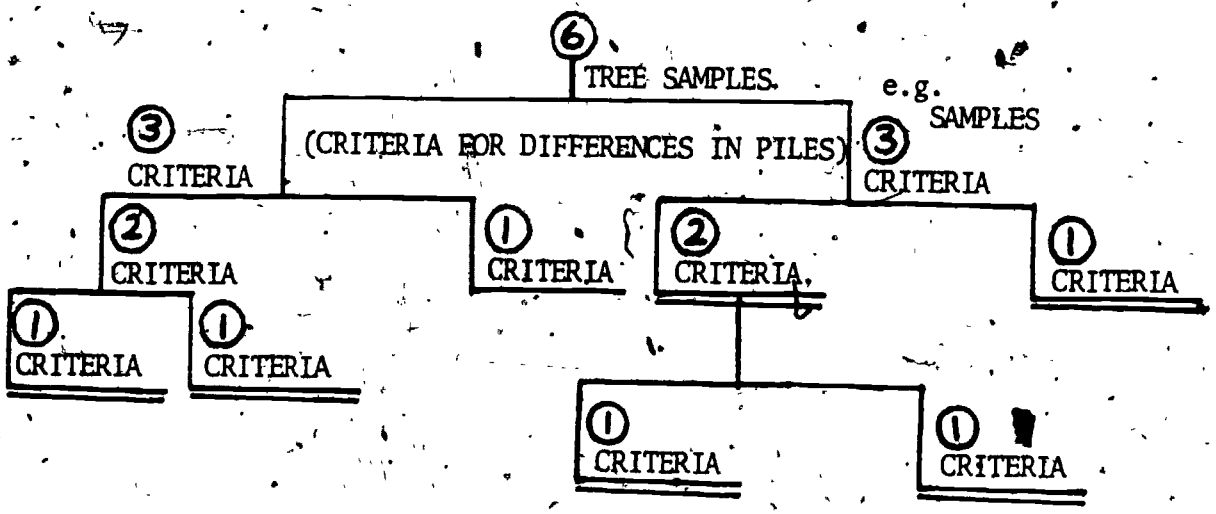
Let's transfer some of the problem solving approaches to another activity. (Distribute 6 different tree specimens (a different one to each person in the group). Read instructions.

1. Look at your own leaf specimen for 1-2 minutes and look for it's observable characteristics.
2. Now each person share what they observed about the characteristics of their sample with other members of the group.
3. Each group put all of the leaf specimens into 2 piles based on the major likenesses and differences of their leaf characteristics. Write down the criteria or reason you used to do it.
4. Ask each group to tell the reasons used as you list on the board. Point out that some groups used different starting points.

5. Your next task is for each group to construct a dichotomous key. What does dichotomous mean? (You may want to draw a sample key on the board to illustrate)

   (Give each group a piece of paper and felt pen. Tell each group to construct their key so everyone can see it.)

TASK B Construct a dichotomous key using your own criteria or starting point for putting the samples into 2 piles. Divide each pile into 2 more piles of samples based on the major likenesses and differences of their leaf characteristics. Continue dividing piles until you only have one specimen left in each pile. (This is one way to make a key - you may want to use another way.)



II. COMMUNICATING ABOUT THE TREE SPECIMENS

TASK C

Now that you have finished your key, as a group: Select one sample and using the words in the key that describe that sample, write a description of it in sentence form.

(Print this task on newsprint so everyone can see.)

Questions and Discussion. (After most or all have finished constructing their key.) Adjust this section to fit needs and background of audience.

1. Have each group read their description; and have the other groups select and hold up the sample they think is being described; have the members of the group that read their description check the other groups to see if they selected the right sample or not. (You may have to ask people to hurry so as not to drag out this part. It is important, though, for each group to read their description.) Ask each group how well the other groups selected the right specimen.
2. After #1 say: I noticed that not all groups selected the sample being described and that not all groups started at the same point. If we assume we have as many different societies in this room as groups, (each with our own way of working as a group, and each with our own language,) then how could we use this classification activity to increase and improve the communication between society? (Committee - common vocabulay, etc.)
3. What else can we do with this key now that we've built it? Discuss groups suggestion. eg:
   a. Demonstrate ability to use the key by adding a new tree sample. See if it fits into your key. Yes - no - why.
   b. Describe the difference between your key and another one. (Change keys with the group next to you. See if you can match up the samples and then compare the 2 keys - yours and theirs.)
   c. Take the key outside and use it to find trees where they are growing. (This is security for teacher and student - the student builds a tool and skill in the classroom and gets to use that tool and skill in the outdoor classroom; the teacher doesn't need to know the names of trees to provide a meaningful learning experience for the student.)
4. Do you know more about the specimens now than when we started? We haven't even talked about names of these trees yet. Names may not be important to begin with. This classification problem allows us to become familiar with observable characteristics of the specimens. Now we are ready to use another written or picture tree key to associate our descriptions with others and to find a name that society has labeled the tree. (Use books like Trees to Know in Colorado and Wyoming)
5. How could we use this key to improve communication between the groups?

IV. DESCRIBING CURRICULUM RELATIONSHIP WITH THREE PARTS

TASK D

Describe other parts of trees we can classify, list curricular areas in which that part of the tree could be used, and describe in what ways..

PART OF TREE	CURRICULAR AREA USED (art, math, S.S., Sc., etc.)	HOW
eg. Bark	art	Construct mosiac. Classify different textures, compare texture; patterns and designs of different kinds of bark

(This is an important task for educators. Could be modified, verbalized, or eliminated depending on time constraints.)

We can use classification as a process to learning--sorting or grouping--no matter what our occupation and in our everyday lives.

Questions and Discussion

1. Many people feel that classifying is strictly a science process, and can't or shouldn't be used in other subjects. We have just disproved that theory by showing we use the processes continuously in order to learn more about things.
2. What other things in the environment can we classify? (eg. shoes, people, rocks, communities, animals, etc.)

V. DESCRIBING VALUES AND PROCESSES

1. Describe the values of classifying things in the environment.

TASK E (10 minutes)

1. Describe the values of classifying things in the environment. Work by yourself or in pairs.

2. Give an example of using classifying as a tool in environmental management.

What are some values you've come up with?

(Examples: Because of group interaction you often look at things in a different way. It simplifies our information gathering; facilitates retention of knowledge; useful for previous history or future predictions; we each looked at it from our own frame of reference.)

2. Mark the process we used in this activity and give an example of how they were use.

TASK F (15 minutes)

Mark the processes used in this activity and give an example of how they were used. (Discuss in small group or large group.)

Process	Example of How Used
observing	
classifying	
measuring	
predicting	
inferring	
communicating	
formulating hypothesis	
experimenting	
interpreting data	

Observing Using all of the senses: hearing, seeing, tasting, smelling, and feeling.

Classifying Identifying objects or ideas and classifying them into groups according to similarities and differences. Students are encouraged to invent their own systems.

Measuring Using both standard units of measurements or invented units, students should have experience in measuring quantities (length, weight, volume, time, temperature, etc.)

Predicting Many students guess with little difficulty. Prediction, however, requires a higher level of thinking. Predictions are also based on some known data or evidence. Simple graphs and charts are helpful for students to use as a basis for prediction.

Inferring The ability to infer is basic to the formulation of hypotheses. Students can learn to infer when they can distinguish between an observation itself and an inference about an observation.

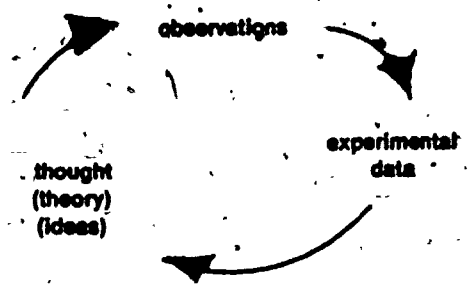
Communicating Clear and precise communication is essential in science. There should be many opportunities to communicate orally, with graphs, with pictures, and, when able, in their writings.

Other processes are more complex and are dependent on the foregoing processes.

Formulating Hypotheses Answers to many inquiries are simple. Many questions may be answered by asking an authority or by referring to the proper book or reference material. Answers to other inquiries require much further scrutiny. The student's initial general observations and informal manipulations may result in an attempt to investigate further or to experiment. A hypothesis based on his preliminary experience and his inferences is necessary to establish the direction of his efforts. Formulating intelligent hypotheses takes practice.

Experimenting Experimenting, as opposed to verifying, indicates a quest for an understanding of an uncertain phenomenon or an answer to an unsolved problem. The organization of this task is usually complex and takes many forms. One important aspect of such activity is the setting up of controls with which experimental results may be compared.

Interpreting Data Through observation and measurement, students will collect data. Can they organize and interpret these findings? True inquiry may begin with theory, observations, or experimental data, but the logical investigator always goes "full circle" regardless of his starting point.



This list was taken from "Science in Oregon Schools," Oregon State Department of Education, and was adapted from materials developed by the American Association for the Advancement of Science for the project AAAS Commission on Science Education

3. What were some processes of group interaction used in this activity?
4. Give an example of how you could adapt this activity and use it in teaching situation.

Summary Questions

1. What did we find out about problem solving techniques in this session?
2. How can we summarize our discussions and investigations?

TASK G

How did you feel about our session today?

BEHAVIORAL OUTCOME IN KNOWLEDGE

As a result of these activities you should be able to:

1. Identify at least six factors that take place within a group to make it work more effectively together.
2. Identify and describe ten processes and their use in environmental data-collecting, interpretation, and problem-solving.

BEHAVIORAL OUTCOME IN FEELINGS, AWARENESS, VALUES, AND ACTIONS

1. Describe the values of classifying things in the environment.
2. Describe the values, and give examples, of using classifying as a tool in environmental management.

Equipment needed:
Blackboard and chalk or easel - newsprint and magic marker
6 bits of information problem sheets cut up
Tree leaf samples in sets of six for _____ number of groups

This lesson was written in 1972 by Char and Ernie McDonald for use in workshops. It is suggested that people using it change or adapt it to fit their own situation.
(Revised in 1973)

1. In what ways were the 6 bits and the classification activities alike?
2. Give announcements for breakfast time and the next days activities.

Conclusion: The things we've done tonight (group-problem solving and processes) are typical of the processes that we will use during the rest of the week. Even though we will be investigating one environment, the same skills and processes are transferable to any environment.

They are now used in problem-solving situations in our cities. In fact, one of our sessions includes planning for an urban investigation.

These types of skills and techniques can assist us in setting up problem-solving experiences for people to learn more about their role in the management of their environment.

6 BITS OF INFORMATION PROBLEM

by Dr. Michael Giammatteo

$B_2 1$

Although you may tell your group what is on this slip, you may not pass it around for others to read.

Information:

The Dinosaurs had Tom for a teacher during the third period.

Dick and Belinda did not get along well and so they did not work together.

During the first period the Team Leader taught the group that Harry liked best.

$B_2 2$

Although you may tell your group what is on this slip, you may not pass it around for others to read.

Information:

All teachers taught at the same time and exchanged groups at the end of each period.

Each teacher liked a different group best. During the second period each teacher taught the group he liked best.

Each teacher taught every group during one of the first four periods of the day.

$B_2 3$

Although you may tell your group what is on this slip, you may not pass it around for others to read.

Information:

The Freznel Elementary School Intermediate Unit had two teacher's aides, four teachers, and four instructional groups of students.

Each instructional group had chosen its own name.

Sybil was the Team Leader for the Intermediate Unit.

$B_2 4$

Although you may tell your group what is on this slip, you may not pass it around for others to read.

Information:

Your group members have all the information needed to find the answer to the following question. Only one answer is correct. You can prove it.

IN WHAT SEQUENCE DID THE APES HAVE THE VARIOUS TEACHERS DURING THE FIRST FOUR PERIODS?

Some of the information your group has is irrelevant and will not help solve the problem.

$B_2 5$

Although you may tell your group what is on this slip, you may not pass it around for others to read.

Information:

Belinda and Ralph disagreed about how it would be best to handle the Bombers who always had trouble settling down to work.

Dick preferred to work with the Champs over all other groups.

Although the Team Leader had been at Freznel School for five years, this was a shorter period of time than for the other team members.

$B_2 6$

Although you may tell your group what is on this slip, you may not pass it around for others to read.

Information:

The Team Leader taught the Dinosaurs the second period.

Harry worked with the Bombers in the third period.

Sybil had been at Freznel School a shorter period of time than any of the other teachers in the Intermediate Unit.

$B_1 1$

Although you may tell your group what is on this slip, you may not pass it around for others to read.

Information:

All teachers taught at the same time and exchanged groups at the end of each period.

Each teacher liked a different group best. Each teacher taught the group he liked best during the fourth period.

Carl was the Team Leader for the Intermediate unit.

$B_1 2$

Although you may tell your group what is on this slip, you may not pass it around for others to read.

Information:

The Team Leader taught the Buckaroos during the first period.

Working out a schedule was difficult because Carl and Dottie wanted Edward to work with them during the same period.

Edward and Frieda could never agree on which group was easiest to handle.

$B_1 3$

Although you may tell your group what is on this slip, you may not pass it around for others to read.

Information:

Your group members have all the information needed to find the answer to the following question. Only one answer is correct.

IN WHAT SEQUENCE DID DOTTIE TEACH THE VARIOUS INSTRUCTIONAL GROUPS?

Some of the information your group has is irrelevant and will not help solve the problem.

$B_1 4$

Although you may tell your group what is on this slip, you may not pass it around for others to read.

Information:

Dottie taught the Freewheelers during the second period.

The Jets had three more members than the Aces.

The Jets had Agnes for a teacher during their third period.

$B_1 5$

Although you may tell your group what is on this slip, you may not pass it around for others to read.

Information:

Each teacher taught every group during one of the first four periods of the day.

During the first period Agnes taught the Aces.

Of all the groups, Bob liked best to work with the Aces.

$B_1 6$

Although you may tell your group what is on this slip, you may not pass it around for others to read.

Information:

The Howell Elementary School Intermediate Unit had four teachers, two teacher's aides, and four instructional groups of students.

Each instructional group had chosen its own name.

DATA COLLECTING GUIDELINES FOR ENVIRONMENTAL PROBLEM SOLVING

DEFINING THE PROBLEM

What problem or issue is involved?

What are some factors that contribute to the problem or issue?

What do you want to find out about this problem and/or its factors?

DATA COLLECTING AND RECORDING

What kind of data needs to be collected?

Which places are available for data collecting?

What methods and materials are available for collecting this data? (visual observation, testing equipment for biophysical data, past records, etc.)

Which methods and materials would be most appropriate for your investigation?

How can this data be recorded in a manner that will provide for significant interpretations? (tables, charts, graphs, written observations, maps, sketches, etc.)

What additional information may be needed to help interpret the data you collect?

Construct a data recording instrument in the space below:

DATA INTERPRETING

- What does the collected data tell you about the problem or issue involved?

  What comparisons, contrasts, or cause-and-effect relationships can be inferred from the collected data?

- What big ideas are suggested by the interpretation of this data?

  What implications do these big ideas have to environmental management?

EXTENDING THE INVESTIGATION

Which parts of the investigation can be explored more fully by further data collecting?

What further data needs to be collected? (where? how often? time of year?)

What might be significant about collecting the additional information?

FACTOR	HOW IT CONTRIBUTES TO THE PROBLEM	ALTERNATIVES TO ITS PRESENT CONDITION Select one or more alternatives below and describe how the factor might be changed (Elimination Modification Substitution)	DESCRIBE HOW THE CHANGE WILL EFFECT THE PROBLEM.

Which alternative or combination of alternatives might bring about an improvement or solution of the problem? Give reasons for your choices.

ACTION PLANNING FOR PROBLEM SOLUTION

SUGGESTED ALTERNATIVE SOLUTION	TYPE ACTION NECESSARY TO ALTER CONDITION Technological Social Political	CHANGE AGENTS Individual Group Governmental	IMPLEMENTATION STEPS TO PROBLEM SOLUTION	EVALUATION METHODS

Summary questions:

1. What did you find out?

2. How will the selected solutions contribute to the improvement of the environment?

3. What can we say, in general, about environmental management?

A LESSON PLAN FOR COMPARING ENVIRONMENTS

It is exciting and important to make a comparison between two environments. This can provide an opportunity for a group to explore the factors that allow for differences and likenesses in at least two parts of our total environment.

After an in-depth study of two different environments, have small groups do TASK A.

(Note: An in-depth study of a Forest Environment might include the investigation of Land Use Planning, Measuring Some Water Quality Criteria, Investigating a Forest Environment, and Environmental Habitats. An in-depth study of an Urban Environment might include the investigations of Land Use Planning, Water Quality Criteria, and Urban Investigation.) It might even be between two different ecosystems such as a forest and a meadow.

TASK A: (15 minutes) Work in small groups.

Analyze the data collected for each environment and do the following:

1. List some things you found out about _____ environment.

2. List some things you found out about _____ environment.

Questions and discussion:

1. List and group items on board.
2. Which things are similar in each environment?

Investigating Your Environment Series
U. S. Forest Service
Denver, Colorado

TASK B: (15 minutes). Small groups.

List at least four basic functions of each environment.

_____ environment	_____ environment
1.	
2.	
3.	
4.	

TASK C: (15 minutes) Small groups.

List three factors that affect the quality of the two environments.

_____ environment	_____ environment
1.	1.
2.	2.
3.	3.

Questions and Discussion:

1. Discuss the results of TASK B-C with the group and list on board next to TASK A results.
2. In what way (if any) will the environments have an affect on each other?
3. Based on your own investigations, what are some general factors that apply to both environments.
4. What reasons can you suggest for the similarities and differences between these factors?
5. Summarize the unique contribution of each area to the society.
6. Why are the items in TASK A, B, AND C important to the way we manage environments?

TASK D: (15 minutes) Small groups.

List at least four of the most obvious problems of the two environments.

_____ environment	_____ environment
1.	
2.	
3.	
4.	

TASK E: (20 minutes)

List at least four guidelines that you would use in planning for future land uses in both environments.

1. _____ environment

2. _____ environment

TASK F:

What can we say about Environments?

BEHAVIORAL OUTCOMES IN KNOWLEDGE

Identify four basic functions about each environment.
Describe three ways in which the environments are interrelated.
Identify three factors common to both environments.
Describe three similarities and differences between each environment.

BEHAVIORAL OUTCOMES IN ATTITUDES, AWARENESS, VALUES AND ACTION

Describe at least two unique contributions that each environment makes to society.
Identify at least three guidelines that you would use in planning for management of the environments.
Describe how you feel about man's use of each environment.
Describe your recommendations for the future management of the area.

This lesson plan was developed for use in teacher workshops by:
Ernie and Char McDonald

The lesson plan was revised in November 1971. It is suggested by the writers that continuous revision take place by people who use the ideas.

a lesson plan for

SOME WATER INVESTIGATIONS

Set the stage for this investigation by reviewing quickly what will take place in the allotted time. For example: In this investigation we will develop some skills in collecting and interpreting data about the water environment. We will then apply that data in discussing the role of water in the environment and our society.

I. OBSERVING THE WATER ENVIRONMENT

Distribute: TASK A

As you approach the water you record your observations on TASK A. (10 minutes)

> **TASK A:** Work by yourself or in small groups.
>
> As you approach the water, observe and record your observations.
>
> plants_____
>
> animals_____
>
> air_____
>
> rocks_____
>
> water_____
>
> other_____

Question & Discussion:

1. "What are some things you noticed as you approached the water?"

*Discussion Skills

- Accepting
- Supporting
- Encouraging
- Time to think

II. OBSERVING AND COLLECTING AQUATIC LIFE

Questions and Discussion:

1. "What do you notice about the water environment?"
2. "What are some factors that affect the lives of animals in water?"
3. "Where would you expect to find animals in a water environment?"
4. "What are some guidelines that we need to consider in collecting aquatic life so our investigation will cause the least impact on the environment?"
5. "Using collecting equipment (screens, jelly cups, etc,), collect as many types of aquatic animals as possible. Put them in the white plans for observation by the group. (Keep the pans in a cool place.)"

- Accepting
- Focusing
- Clarifying
- Extending
- Time to think
- Refocusing

III. IDENTIFYING AND RECORDING AQUATIC ANIMALS

Questions & Discussion

1. "Distribute TASK B and pond books. Have group identify as many aquatic insects as possible using the pond life books and aquatic life drawings on back of TASK B!"

TASK B: Work by yourself or in groups
Using the "Golden Nature Guide Pond Life" books or similar field manuals or attached picture keys, generally identify the specimens you found.

List or sketch the animals you found below. Return animals to water as soon as finished.

Description of where found	Type (name or sketch)	No.	Name

Questions and Discussion:

1. "What animals did you find?" You might compile a group list, (preferably on a chart). Each person could record his own list.
2. "Where did you find most of the specimens?"
3. "What other life would you expect to find in this stream?"
4. "What are some things we could do with this list of animals?"

Focusing
Clarifying
Extending
Time to think
Refocusing

IV. PREDICTING WATER CHARACTERISTICS FROM AQUATIC ANIMALS FOUND

Distribute TASK C Cards. Based on aquatic animals you found and the tables in TASK C, predict the temperature, pH and O_2 count. (10 minutes)

TASK C: Work by yourself.

Based on the aquatic animals you found, and the tables below in the Aquatic Data section, and your observations, predict the following characteristics of this stream:

I predict:
the water temperature will be ________ because ________
the air temperature will be ________ because ________
the pH will be ________ because ________
the dissolved O_2 count will be ________ because ________
I can see about _____ ft down into the water.
The color of the water is ________
Keep these predictions for future use.

AQUATIC DATA

Table a PH RANGES THAT SUPPORT AQUATIC LIFE

MOST ACID 1 2 3 4 5 6 7 8 (NEUTRAL) 9 10 11 12 13 14 MOST ALKALINE

Organisms	pH range
Bacteria	1.0 — 13.0
Plants (algae, rooted, etc.)	6.5 — 12.0
Carp, suckers, catfish some insects	6.0 — 9.0
Bass, crappie	6.5 — 8.5
Snails, clams, mussels	7.0 — 9.0
Largest variety of animals (trout, mayfly, stonefly, caddisfly)	6.5 — 7.5

Table b. DISSOLVED OXYGEN REQUIREMENTS FOR NATIVE FISH AND OTHER AQUATIC LIFE

Examples of Life	D. O. in parts per million or/milligrams per liter
Cold-Water Organisms including (salmon and trout) (below 68 degrees F) Spawning, Growth and well-being (caddisfly, stonefly, mayfly.	6 ppm and above
Warm-Water Organisms (including game fish such as bass, crappie, cat fish and carp) (above 68 degrees F) Growth and well-being (some caddis fly)	5 ppm and above

Table c TEMPERATURE RANGES (APPROXIMATE) REQUIRED FOR CERTAIN ORGANISMS

Temperature (Fahrenheit)	Examples of life
Greater than 68° (warm water)	Much plant life, many fish diseases. Most bass, crappie, bluegill, carp, catfish, caddisfly
Middle range (55 - 68°)	Some plant life, some fish diseases Salmon, trout, Stonefly, mayfly, caddisfly, water beetles
Low range (cold) (Less than 55°)	Trout, caddisfly, stonefly, mayfly

V. MEASURING AND RECORDING WATER CHARACTERISTICS TO TEST OUT PREDICTIONS

One way to test out the predictions is to use this (Hach Water (O_2pH) Testing Kit or equivalent). Open kit. The instructions are inside lid. There are lots of jobs to be done in testing (Clipping, squirting, swirling, dipping, counting, reading, etc.) so make sure everyone in the group has a job to do.

Pass out TASK D - Have group transfer their predictions from TASK C to TASK D and then record the test measurements beside the prediction for comparison.

Work in groups of 4-5 people each. Each group take a kit. Spread out along the edge of the water.

NOTE: Do not demonstrate the use of the kit. Let the participants read the instructions and learn to use the kit as they collect the data. You should check among the groups as they work and make sure they use the right bottles, chemicals, etc.

(See back of TASK D, page 12 for analyzing tables.)

TASK D: Work in groups of 4-6 people.

MAKE SURE EVERYONE IN YOUR GROUP GETS INVOLVED IN THE TESTING.

1. Using the water test kit, determine the water and air temperature, dissolved oxygen count, and pH of the stream or pond. Record predictions from TASK C.

Record the data below:

Name of stream, pond or Lake:

Location of water sample (edge or middle of stream, head of pond, etc.)	Time Taken	Temperature: water		Temperature: air		pH		Dissolve Oxygen (ppm) (mg/Liter)	
		My Pred.	Act. Test	My Pred.	Act. Test	My Pred.	Act. Test	My Pred	Actual Test

2. Water productivity and color.
Based on the color you recorded in TASK C and the table a. What can you say about this water?_____

3. Light penetration
My estimate of how far I could see into water from TASK C, is _____ ft.
Transparency of lake and pond water can be roughly determined by the use of a white and black plate (called a secchi disk) which is lowered on a line until it can no longer be seen. It is approximately 8 inches in diameter, painted white and black in alternative quadrants. Very little sunlight penetrates below the point at which the disk disappears.

Lower the Secchi disk into the water until it can no longer be seen. Measure depth from surface of the water to the disk and record _____ ft.
Based on the depth of the Secchi disk and table b, which can you say about the water?

4. Temperature layering (pond or lake)
Based on the temperatures you recorded for your pond, the season of year and the information in table c describe what you think is happening in the water now.

Questions and discussion:

1. "How did the test results compare to the predictions?"
2. "Under what conditions might we expect to get different results than we did today?"
3. "What can we say about the quality of the water in this stream so far?"
4. "What else would we need to know to decide whether or not to drink this water?" (Coloform bacteria count)

Clarifying
Extending
Lifting
Time to think
Refocusing

VI. MEASURING WATER VOLUMES FOR STREAM OR POND

A. Stream Measurements

Questions and Discussion:

1. "How many people do you think could live off the water in this stream?"(domestic water use only)
2. "What measurements do we need to know in order to determine the amount of water in this stream?" Discuss how to make different measurements.

Accepting
Encouraging

Pass out TASK Card E. For stream - Have group do together (15 minutes)

TASK E: For Streams — Work in groups.

Instructions for collecting and recording streamflow measurements.

a. Measure and mark a 100-foot distance along a straight section of your stream. If you can't find a 100' section, use 25' or 50'. Throw a stick (5 or 6 inches long) in the water above the upstream marker. Record the number of seconds it takes to float downstream between the markers. Record below. Now divide the 100-foot distance by the total seconds it took the stick to float between the stakes. Do this three times and use the average time.

1st measurement 100 ft. • _____ (distance) • _____ (total seconds to float 100 ft) = _____ (number of feet stick floated each second) ft. per second.

2nd measurement 100 ft • _____ • _____ = _____ ft. per second

3rd measurement 100 ft • _____ • _____ = _____ ft. per second.

Total _____ (ft per second) ÷ 3 = _____ (ft per second average)

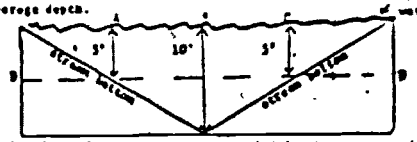
b. Find the average width of your section of the stream. Measure the width of the stream at 3 places within the 100-foot area. Divide the total by 3 to get the average width of the stream.

First measurement _____ feet
Second measurement _____ feet
Third measurement _____ feet
Total _____ feet ÷ 3 = _____ ft. (average width)

c. Find the average depth of your section of the stream. Measure the depth of the stream in 3 places across the stream in a straight line. Divide the total by 4 to get the average depth of the stream.

First measurement _____ feet.
Second measurement _____ feet.
Third measurement _____ feet.
Total _____ feet ÷ 4 = _____ ft. (average depth)

NOTE: The reason you take 3 depth measurements then divide by 4 is to take into account the shallow areas of the stream. It can be explained by the following example of a drawing of a stream cross-section. If depth in 3 places is A(5'), B(10') and C(5'). (total 20') find an average by dividing by 3 then 20' ÷ 3 = 6 2/3'. Now look at the same average depth (D) which is 5'. Take total of depths and divide by 4. 20' ÷ 4 = 5', the correct average depth.



d. Find the cubic feet of water per second. Multiply the average width, average depth, and the number of feet the stick floated each second.

_____ ft. (Average width) × _____ ft. (Average depth) × _____ (Number of feet per second) = _____ (Cubic feet of water flowing per second)

NOTE: A cubic foot of water is the water in a container 1 foot wide, 1 foot high and 1 foot long, and contains 7.48 gallons.

In order to find out how many people could live from the water in this stream, complete the following calculations.

_____ (Stream flow in Cu. Ft. per sec.) × _____ (Gallons in 1 cu. ft. of water) = _____ (Gallons of water per second)

_____ (Gallons per second) × _____ (Seconds in minute) = _____ (Gallons of water per minute)

_____ (Gallons of water per min.) × _____ (No. minutes in a day) = _____ (Total gallons water per day) ÷ 9200 Gals. (Amount of water one person uses per day) = _____ (Total No. people who could live from water in this stream)

*The average person uses about 200 gallons of water a day for home use. This does not reflect each persons share of water used for industrial, public services, and commercial. U.S. Office of Education figures.

Questions and Discussion:

1. "How many people could live for one day (domestic use only) off the water in this stream?"
2. "How did your prediction compare with your measurement?"
3. "What would happen to this environment if we piped all the water at this point to a community?"
4. "If we were going to use some of this water, how much should be left to flow downstream? Why?"
5. "What might affect the amount of water in this stream?"
6. "How important is this stream to (a) community? to the environment here?"

Accepting
Supporting
Clarifying
Extending
Lifting
Time to think
Refocusing

B. Pond and Lake Measurements

Questions and Discussion:

1. "How many people do you think could live off the water in this pond (or lake)?" (domestic water use only)
2. "What measurements do we need to know in order to determine the volume of water in this pond?"

Acceptance
Encouraging

Pass out TASK card E. For pond & lake have group do together. (15 minutes)

TASK E: For Ponds & Lakes — Work in groups.

Instructions for collecting and recording volumes of water in ponds or lakes.

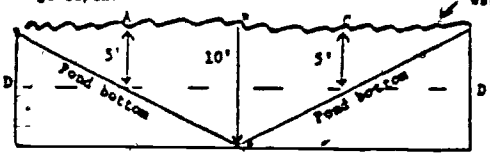
a. Find the average diameter (distance across) of the pond. Measure the length and width of the pond. You may have to take several length and width measurements and get average of them.

Pond width _____ ft.
Pond length _____ ft.
Total _____ ft ÷ 2 = ____ ft. (average diameter)
Average diameter _____ ft x 3.14( ) ÷ 4 = _____ sq ft surface.
(area of pond)

b. Find the average depth of the pond or lake. Measure the depth in 3 places along a line (transect) across the pond, as near the middle as possible. Add these depths and divide by 4 (see explanation below) to get the average depth. (If additional accuracy is desired, repeat this process along additional transects and average results.)

First measurement _____ feet.
Second measurement _____ feet.
Third measurement _____ feet.
Total _____ feet ÷ 4 = _____ ft. (average depth)

NOTE: The reason you take 3 depth measurements then divide by 4 is to take into account the shallow areas of the pond. It can be explained by the following drawing of a pond cross-section. If depth in 3 places is A(5'), B (10') and C(5'), (total 20') and you find an average by dividing by 3 then 20' ÷ 3 = 6 2/3'. Note that the actual mean or average depth (D) is 5'. Take total of depths and divide by 4. 20' ÷ 4=5', the correct average depth.



c. Formula for computing number of gallons of water in pond.

1. _____ (Area of pond) X _____ (Average depth) = _____ (Volume in Cubic feet)
2. _____ (Volume in Cu. Ft.) X 7.48 = _____ (No. Gals. water in pond)

NOTE: A cubic foot of water is the water in a container 1-foot wide, 1-foot high, and 1-foot long and contains 7.48 gallons.

d. Formula for computing the volume using acre feet of water.

1. _____ (Surface) Area of pond in feet X _____ (Average depth in feet) = _____ (Volume Cu. Ft.)
2. _____ (Volume Cu. Ft.) ÷ 43560 (sq ft in an acre) = _____ acre feet of water.
3. _____ (Acre Feet) X 325,900 (Gal./Acre Foot) = _____ (No. Gallons in pond)

e. In order to find out how many people could get their domestic needs for one day from the water in the pond, complete the following calculations.

_____ (Gallons of water in the pond) ÷ _____ (Amount of water one person uses per day) = _____ (Total No. people who could live one day from this water)

*The average person uses about 200 gallons of water a day for home use. This does not reflect each person's share of water used for industrial, public services, and commercial. U.S. Office of Education figures.

Questions and Discussion:

1. "How many people could live for one day (domestic use only) off the water in this pond?"
2. "How did your prediction compare with your computations?"
3. "What might affect the amount of water in this pond?"
4. "What would happen to this aquatic environment if we drained it?"
5. "If we were going to use some of this water, how much should be left to minimize damage to the pond environment?"
6. "How important is this pond to the environment?"

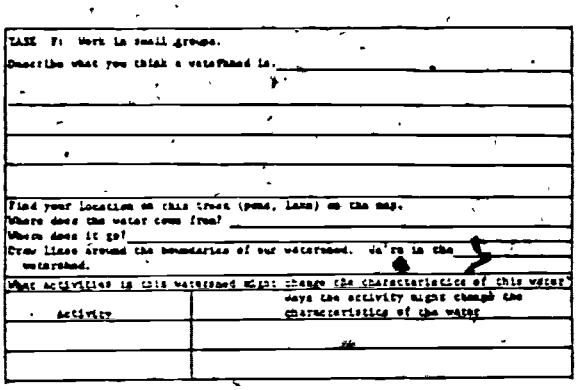
Accepting
Supporting
Clarifying
Extending
Lifting
Time to Think
Refocusing

VII. -DETERMINING WATERSHED BOUNDARIES

Distribute Task F and a map of the area in which you have been working.

Have participants get into small groups and write a description of what they think a watershed is. Have groups share their definition with the other groups. (10 minutes)

Finish TASK F.



TASK F: Work in small groups.

Describe what you think a watershed is.

Find your location on this trout (pond, lake) on the map.

Where does the water come from? _____

Where does it go? _____

Draw lines around the boundaries of our watershed. We're in the _____ watershed.

What activities in this watershed might change the characteristics of this water?

Activity	Why the activity might change the characteristics of the water

Questions and Discussion:

1. "What activities did you list and how did you think they would change the water characteristics?"
2. "Are any of these evident here?"
3. "How would we find out more about this watershed?"

Accepting
Clarifying
Extending
Time to Think
Refocusing

TASK G: Work by yourself.

1. Describe in writing how you feel about man's effect on the aquatic environment at this site:

2. Describe at least one action you can take in your everyday life to help improve the way water is managed:

   a) in your home: _____

   b) in your community: _____

   c) in your consumer habits: _____

3. Describe the benefits of each action in #2.

Questions and Discussion:

1. Discuss Task G
2. "What are some inferences we might make about the way water is used in our community?"
3. "What are some implications about the ways we use water now in relation to future water needs?"

VIII. SUMMARY QUESTIONS

1. "What did we find out about water from our investigations today?"
2. "How can we summarize our discussions and investigations?"
3. "What are some methods and processes we used in our investigations in this session?" (May be useful for 1st field sessions to identify processes used in the investigation.)
4. You may want the participants to evaluate the session by writing how they felt about our session today.

Lifting
Time to Think
Summarizing

IX. SOME OBJECTIVES

Behavioral Outcomes in Knowledge

As a result of these activities, participants should be able to:

Identify the boundaries of the _____ Creek watershed on the map provided.

Using the list of aquatic animals found, and the water interpretation charts provided, predict the pH, temperature, and dissolved oxygen count of the stream or pond.

Demonstrate the ability to test out the above predictions using the water testing kit.

Measure the cubic feet of water per second flowing in the stream, or in the pond and determine what size community of people could live off the water measured.

Describe 3 ways this stream or pond is important to the surrounding environment.

Behavioral Outcomes in Feelings, Awareness, Values, and Action

As a result of these activities, participants should be able to:

Describe in writing how you feel about man's effect on the aquatic environment at this site.

Describe at least one action you can take in your everyday life to help improve the way water is managed:
a) in your home
b) in your community
c) in your consumer habits

Describe the benefits of each of the above actions.

Describe the implications of water use and management in our society.

X. EQUIPMENT NEEDED (for a class of 30 people)

4 water testing kits (Hach Co. or equivalent)
4 thermometers
4 white dishpans
30 sets of lab sheets
1 Secchi disk
30 jelly cups/baby food jars etc.
30 hand lenses
15 Pond Life books (Golden Nature Guides)
30 maps of the area
1 50' or 100' tapes
4 screens (optional)
magic markers
chart paper

This lesson plan was developed for use in environmental workshops in 1971 and revised in 1974-75. The people who developed and revised this plan include: Diane Brownfield, Milwaukie, Oregon; Jim Unterwegner, Vancouver, Washington; Charline and Ernie McDonald, Portland, Oregon; George Worley and Pam Fraser, Albuquerque, New Mexico; Fred Olin, Port Orchard, Washington; Cliff Nelson, Seattle, Washington; Dennie Lambert, Harrisonburg, Virginia; Gary Severson, Denver, Colorado; Delores Claybaugh, Fresno, California; Ron Greenwald, Washington, D.C.

Aquatic animal drawings reprinted by permission of the Oregon State Game Commission.

The tasks and discussion topics in this lesson are designed so that many can be done individually or in combination depending upon the facilitators objectives and time contraints.

*The discussion skills listed are examples of those necessary to carry out the lesson. Additional information or discussion skills are in the Lesson Plan for Developing Environmental Investigations in this series.

LESSON PLAN OUTLINE FOR INVESTIGATING

ANIMALS AND THEIR ENVIRONMENTS

Set the stage by stating the problem that we will try to solve. "What relationships exhist between animals and their environment here at _____." (Post problem on chart paper)

1. "What can we collect here in the next ___ hours that will help us solve our problem?" (Accept all answers)

I. OBSERVING AND MEASURING ANIMAL EVIDENCES

Pre-Investigation questions, predictions and discussion

1. "What animals would you expect (predict) to find evidence of in this area?"
2. "What evidences might we find that animals have been here?"
3. "As you look around you, what places can you see that might have different evidences of animals?"
4. "What guidelines might you establish with a group, at this point, to help them think of their potential impact on animals and habitats while doing the next task."

Investigating Your Environment Series
U.S. Forest Service
DENVER, COLORADO -- 1975

Task A (45 minutes)

In your small group, spend 15 minutes in each of the three habitat types that your group identified and record the following information:

1. Characteristics of the habitat type (vegetation, soils, moisture relationships, temperature, man's influence, etc.)
2. Evidence (signs) of animals (sightings, sounds, smells, tracks, droppings, nests, burrows, partially eaten foods, etc.)
3. Relative numbers of animal evidences (of different species or within a species).

_____
(Your name for habitat)

_____
(Your name for habitat)

_____
(Your name for habitat)

Questions and discussion

1. "What did you find?"

2. "How did you describe the habitat types?"

3. "What animal evidences did you find?"

4. "Which animal evidences did you find together?" "Why?"

Task B (15 minutes)

In your group make a visual display of the relative number of animals (animal evidences) that you found in the three habitat types. Make display any way you want.

Questions and discussion

1. "From what we've found and displayed, which of the habitats seems to have the most evidence of animals?"

2. "Which has the most variety of animals?" (Or of different animal species)

3. "What can we say from our investigation about animals and their environment?"

Elapsed time: 1½ hours

II. OBSERVING ANIMAL ADAPTATIONS

"In order for us to focus on some relationships between animals and their food needs. We can use the classification process to closer look at tooth and mouth adaptations for food use."

Task C (30 minutes)

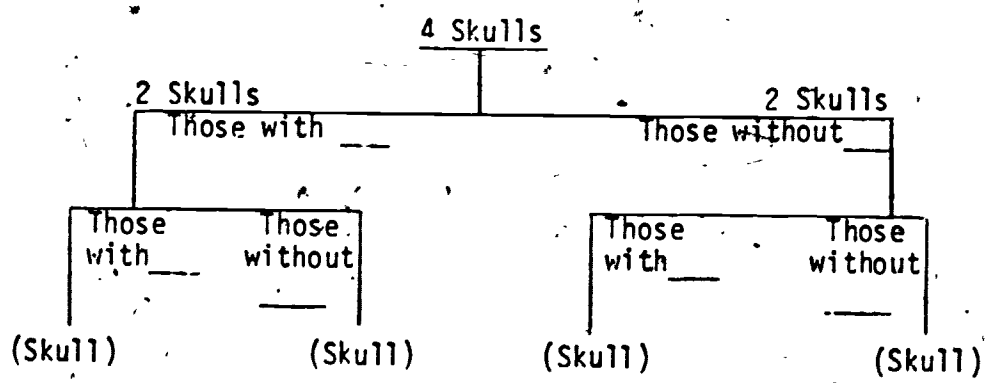
1. Observe the skulls that you have been given. Look at the characteristics of their teeth and/or mouth.

2. Place the skulls into two piles based on likeness and difference of their tooth or mouth characteristics. Try to use observations rather than inferences.

3. Make a large key on flip chart paper starting with the two piles that you've made. Write the reason for the two piles you've made.

4. Continue to divide the 2 piles into two more piles and write the reason. Continue dividing the skulls until each has been singled out.

Here is a sample key:



5. Leave your skulls and key and rotate to a key another group has made. Try to place their animal skulls in the appropriate places on their key.

6. Place the skulls that have teeth into one of the following three categories based on characteristics of their upper and lower back teeth.

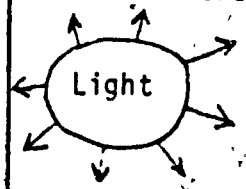
Mainly sheering back teeth that cut like scissors CARNIVORE	Mainly grinding, back teeth, like our back teeth HERBIVORE	Both Grinding and sheering back teeth or teeth modified to do both cutting and grinding OMNIVORE

III. EXPLORING RELATIONSHIPS BETWEEN ANIMALS AND OTHER ENVIRONMENTAL FACTORS

Optional Activitiv #1

Task D-1 (15 minutes)

List the animal evidences we have found in the appropriate places in this diagram. Also list other things you may have found in the blanks provided. Put in arrows to show which factors or groups of things affect other factors or groups.



Plants _____

Nutrients

Herbivores (plant eaters) _____

Decomposers
(bacteria-fungus) _____

Carnivores (meat eaters) _____

Death

What would happen if one group were eliminated?
If _____ group was eliminated, I think the following would happen: _____

Questions and Discussion (5 minutes)

1. What would happen if the decomposers were removed from this ecosystem? The Carnivores? The Herbivores?
2. How does the energy cycle relate to a food chain?
3. What is a food chain? (Who eats who?)

Optional Activity #2

To help us evaluate this environment and explore other relationships let us now trade place with some animals and take a critical look at one habitat type through their eyes.

Task D-2 (15 minutes)

Working with another person take an animal card and evaluate this area as a pair of the animals would.

"We are a pair of _____ (animal)"

1. How would you rate the area for your following needs:
   a. General habitat: _____
   b. Winter and summer food supply: _____
   c. Evidence of your predators: _____
   d. Other factors: _____
2. What evidence can you find that others of your kind live here?

   How will they feel about you two moving in? _____
3. Which of the habitat type will you choose? _____

   Where will you locate your home, nest, den, burrow? _____

   Why? _____
4. What evidence can you find that man has changed this area?
5. How do you animals feel about the changes that man has made here? _____
6. Why are you animals important in this environment? _____
7. Considering all things we have investigated here, we _____ have decided: _____ animal

Optional Activity #3

In our investigations today... we have observed adaptations that animals have for living successfully in their environment. Let's put these adaptations together and design a "model" animal for one habitat found here.

Task D-3 (15 minutes)

Working by yourself design a "model" animal on your sketch paper that you feel would be perfectly adapted to one habitat found here. Note on your paper the adaptations, advantages, etc. When you have finished, give your animal a name that seems to sum up its characteristics.

Consider the following:

1. Adaptations for food gathering.
2. Adaptations for defense, protection.
3. Adaptations for seasonal changes.
4. Major foods required (kind and amount).
5. Amount of habitat required for needs.
6. Value of animal to environment.

Summary questions and discussion

1. From our investigations and discussions today, what have we found out about animals and their environment?
2. Why are animals important anyway?

IV. APPLYING WHAT WE FOUND OUT

From our investigations and discussions here today, we have found out many things concerning relationships between animals and their environment. This knowledge, however, may be of little use to us unless we can find some way to apply it back Home where we live. Working by yourself think of some things you can do.

Task E (15 minutes)

Describe in writing 3 things you can do in your everyday life to make the energy cycle more efficient and cause the least amount of harm to the ecosystem.

Select the one you think would be your best contribution. Describe the benefits of this action--

a. Where you live--
b. In your consumer habits--

Summary questions and discussion

1. What can we do back Home?
2. What did we find out today?
3. If you had to leave out 1 task, which one would it be?
4. How did these activities and your facilitator allow you to take more responsibility for your own learning?

BEHAVIORAL OUTCOMES IN TERMS OF KNOWLEDGE

As a result of these activities, you should now be able to:

1. Identify and describe 3 different habitat types.
2. Identify and describe 6 different animal adaptations.
3. Design a visual display showing relative numbers of animals in different habitats.
4. Construct a diagram of an energy cycle using the evidences of animal life observed
5. Design and sketch an animal well adapted to one habitat observed.

BEHAVIORAL OUTCOMES IN TERMS OF FEELINGS, AWARENESS, VALUES, AND ACTION

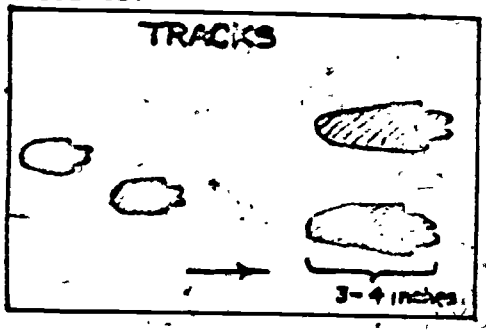
As a result of these activities, you should be able to:

1. Evaluate one habitat through the eyes of one local animal.
2. Describe 3 ways of applying what we learned when we get back home.

SAMPLE ANIMAL CARD

COTTONTAIL RABBIT

EVIDENCE:



Droppings small 1/8-1/4" diameter. Tan to brown, round, glossy.

Burrows hidden in brushy places. Small 4-5" dia.

Narrow well worn trails and "nesting" spots under brush clumps.

Small twigs eaten and bark showing teeth marks near to ground level

HABITAT: Areas with brushy thickets. Forest areas with open sunlit patches, cover to hide in and with winter food supply important. Weed cover and brushy fence rows are good habitat areas.

FOOD NEEDS: (summer) Almost any green succulent plants, weed seeds, grass. (winter) Small twigs and bark. Birch, willow, and alder used.

POPULATIONS: 1 rabbit per four acres is considered a good population. 2 rabbits per acre is considered high.

PREDATORS: (on adult) Coyote, man fox, dog, hawk, eagle, bob cat. (on young) In addition to the above, snakes and skunks.

This lesson plan was developed originally by Pete Hinds, Milwaukie, Oregon; Ernie McDonald, Portland, Oregon; and Russ Hupe, Olympia, Washington in 1971. It has been materially revised from ideas by Liz Bradley, Las Vegas, Nevada; Lea Murgoitio, Boise, Idaho; Reven Oilhein, Boise, Idaho; and Vern Fridley, Ogden, Utah, June 1974.

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a lesson plan for

SOME FOREST INVESTIGATIONS

Set this stage for this investigation by reviewing quickly what will take place in the allotted time. For example: "In this session we will develop some skills in collecting and interpreting data about the forest, and then communicate those interpretations using different methods and processes."

I. OBSERVING AND INFERRING WITH CROSS SECTIONS.

Distribute cross sections of trees 4'-6" diameter that show a variety of growth patterns and influences (fire, insects, etc.).

Have people spend a few minutes looking at the cross sections. (5 minutes)

Questions & Discussion:

*Discussion Skills

- Accepting
- Supporting
- Encouraging
- Time to think

1. "What are some of the things you noticed about the cross section?" (List on board)
2. Point to 2 or 3 items from the list that deal with growth characteristics and rings. (varing widths of growth rings, center not in the center, etc.)
3. "What are some possible reasons for _ _ _ _ (select some observations) _ _ _ ." "In general, what could growth rings tell us about a group of trees? (eg: competition, climate, temperature)"
4. Pass out TASK A & B and say: "This is what we just did and here is the TASK card for your reference later."

Refer to the information on TASK A about tree growth rings.

TASK A:

Work with 1 or 2 other people.
Write down some things you notice about the cross sections.

TASK B:

Work with 1 or 2 other people.
Select 3 observations about the cross sections from the group list.
List possible reasons for those observations.
List ways you could set up an investigation to find out more about your observations and inferences.

Observation (What You Noticed)	Inference (Possible Reasons For This)	Investigations (How We Could Find Out)
1.		
2.		
3.		

Tree Rings Information.
The current year's growth is the ring next to the cambium layer just inside the bark. The rapid spring growth is lighter colored than the growth made in the summer, so a light and dark colored ring makes one year's growth. It is easier to see and count the number wood or dark rings to determine the age of the stump or a log of a tree when it was cut.

These rings are easily counted on the stumps of cut trees.

How old was this tree when it was cut? ____ The dark rings are summer-wood and the light rings are spring wood. One light and one dark ring makes one year's growth.

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II. COLLECTING AND INTERPRETING DATA ABOUT TREE GROWTH RATES AND COMPETITION

TASK C (with tree cores) requires preparation by the instructor before the session.

A tree stand should be selected for study, 4-5 trees tagged, numbered, diameter taken and bored. (trees should be selected that show effects of environmental conditions—injury, overcrowding, lack of sunlight, etc...). The tagged and numbered trees should be bored with an increment borer, by the instructor ahead of time: (Cores should be numbered corresponding to numbers on trees. Taping tree cores to cardboard with see through scotch tape or in plastic straws will help keep them longer if liquid resin is not available. In any event, keep the numbered cores and trees to use again. This eliminates the necessity of reboring the trees.

NOTE: Maybe you can find and use stumps of trees that grow under a variety of competition influences instead of tree cores.

Question & Discussion (Notes 1-6 below are all planning steps to setting up an investigation and should be done away from the study trees.)

1. Pass out hand lenses, pencils, the numbered tree cores taped to cardboard and TASK C. "Observe the tree core your group has been given and record the information in part 1 (10 minutes)

Accepting
Supporting
Clarifying
Extending
Time to think

TASK C: Work in groups of 4-5 people

1. Observe the tree core your group has been given and record the following information: (See drawing of tree-core to help interpret the tree core you have been given.)

Tree #	# Dark Rings From Center to Bark (Approx. Age)	Remarks about the pattern of the rings

2. When your group has the above information, one person from the group should record this information on the blackboard or easel board. Chart to be like TASK C, part 2.

DRAWING OF TYPICAL TREE CORE

Center, start counting here — Bark

Last year's growth

Record the following information about tree cores from the master chart. (Instructor will provide the diameter information.)

Tree #	# Dark Rings From Center to Bark (Approx. Age)	Diameter of Tree Trunk (Cir. ÷)	Remarks about the Ring Pattern
1			
2			
3			
4			
5			
6			

3. Set up an investigation to find out reasons for some of the differences in the data.
   a. Select 2-3 trees from the list that show differences in growth rates.
   b. Which trees did you select? (Indicate by number) _____
   c. Why did you select these trees? _____

4. Go with your group to the site of the trees you selected for investigation and do (Part 4)

   Collecting and Recording Data =
   Record your observations:

   Interpreting Data
   Record possible interpretations of the above data:

   Summarizing your investigation
   Write your group's summary below, including:
   - what you were trying to find out
   - what data you collected about it
   - what interpretations you made
   - what other data would you collect about your investigation?

2. Have each group tell you the information for number of dark rings from center to bark (Col #1) and remarks about the ring pattern (Col #3) while you record on a large chart (see TASK C, part 2) Ask - "What does this tell us about the trees these cores came from?"

3. Now put the diameters on the chart and have everyone record them in Col #2 on TASK C, part 2. Ask - "Now what does this added information tell us?"

4. "Go on to TASK C part 3. Pick out 2-3 trees from the chart that show differences in growth and set up an investigation to find out why there are differences."

5. Have each group take TASK C to the area where the trees are tagged and numbered. Have them spend 10-15 minutes doing the investigation and completing TASK C part 4.

6. When all groups are finished ask for a 2-3 minute summary from each group. (Outside) "What did you find out?"

7. "What are some of the major factors that you think are affecting the growth of this forest?"

8. "What does the information tell us about the past events of this environment?"

Accepting
Supporting
Clarifying
Extending
Lifting
Time to think

III. OBSERVING EVIDENCE OF CHANGE

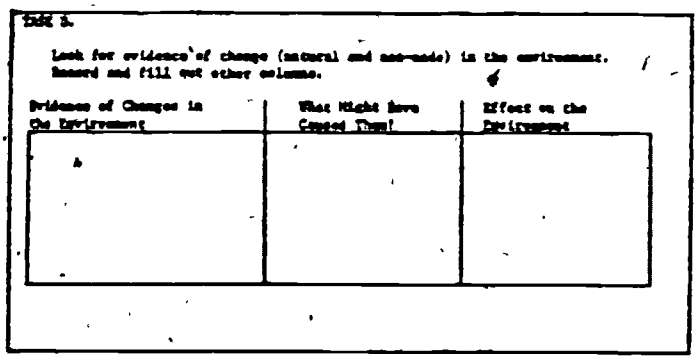
Pass out TASK D.

Question & Discussion:

1. "What evidences of change (natural & man-made) might there be in this environment?".

2. "Spend the next 20 minutes looking for evidences of change and recording them on TASK D."

Accepting
Supporting
Clarifying


TASK D.

Look for evidence of change (natural and man-made) in the environment. Record and fill out other columns.

Evidence of Changes in the Environment	What Might Have Caused Them?	Effect on the Environment

Question & Discussion:

1. "What evidences did you find?" (Have group develop a total list. (Record on chart in front of total group, if possible.)
2. "What could we do with this list?" *This is a key question
3. "Get into groups and put the whole list into a sequence." (Possible activity)

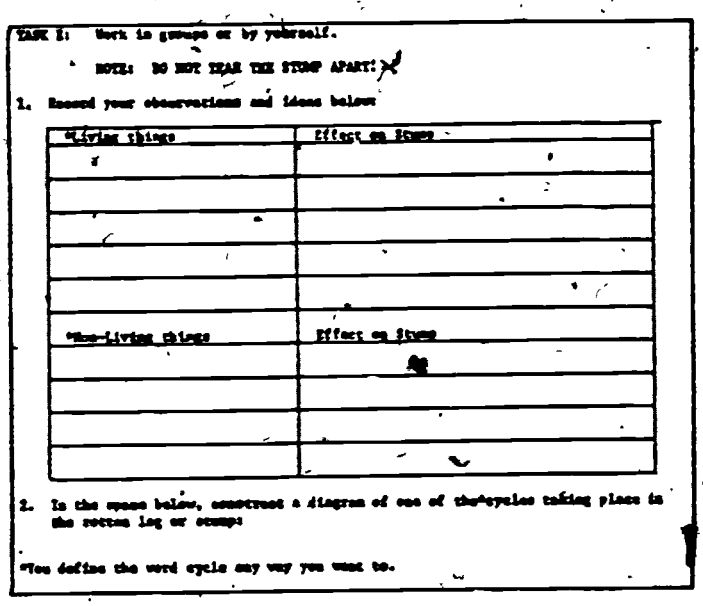
Accepting
Supporting

IV. OBSERVING & RECORDING THINGS ABOUT A ROTTEN LOG OR STUMP

Question & Discussion

Accepting
Supporting
Encouraging

1. "Let's focus in on one evidence of change on this rotten log (stump)?"
2. Pass out hand lenses and demonstrate how to use the hand lense (many people have never used them before).
3. Pass out TASK E. "Notice on TASK E is a 'NOTE: DO NOT TEAR THE STUMP APART.' Why do you think that note is there?" "Spend 10 minutes observing the log and recording your observations and interpretation on TASK E."



TASK E: Work in groups or by yourself.

NOTE: DO NOT TEAR THE STUMP APART!

1. Record your observations and ideas below:

*Living things	Effect on Stump
*Non-living things	Effect on Stump

2. In the space below, construct a diagram of one of the cycles taking place in the rotten log or stump:

*You define the word cycle any way you want to.

Question & Discussion:

1. Ask for volunteers to share what their diagram or cycle looks like. (If appropriate - comment how people defined and illustrated the word cycle differently.)

V. COMMUNICATING INTERPRETATIONS THROUGH SKETCHING AND WRITING.

Distribute sketching paper, and pieces of charcoal from a campfire or fireplace.

Question & Discussion

1. Construct a sketch of the log or stump you just studied using charcoal from a campfire or fireplace. Other sketching materials will be given to you as you work.

   NOTE: Subject of sketch depends on the environment. It can be anything that is significant about the area.... rotten log, stump, or snag, an old homestead, fence, or barn, a city building, transmission tower, or freeway.

2. While people are sketching, go around and give them:
   rotten wood - brown dandelion leaves - green dandelion flowers - yellow
   other goodies, in season.
3. If you're not in the woods, IMPROVISE!

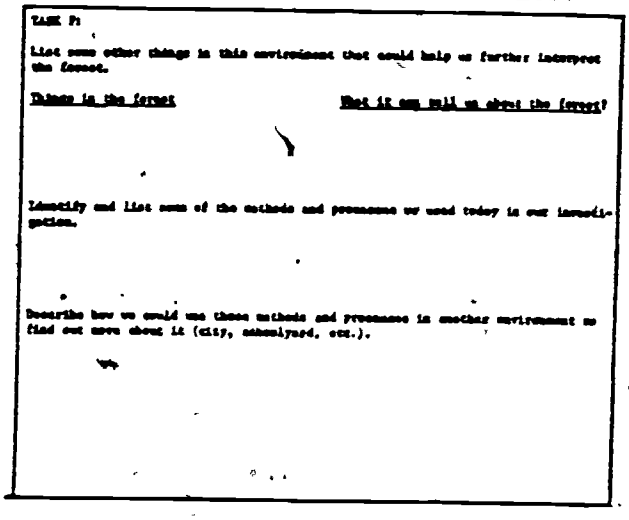
Note: Begin this part when about half the people finish their sketch.

Question & Discussion

1. "Use your pencil or pen. Find a place on your sketch (across the bottom, or down the side) to write some things as I give you the directions."
2. "Directions."
   a. Write 2 descriptive words about the stump.
      (words that tell what it looks like) - repeat instruction
   b. Write 3 action words about the stump.
      (words that describe processes or changes taking place, or things happening to it) - repeat instruction.
   c. Now write a short phrase (4-5 words) that tells how the stump affects the rest of the environment. (a phrase to describe its value or usefulness) (or a phrase describing any thought you have about the stump) (repeat instruction)
   d. Write 1 word that sums up everything about the stump.
      (a word that suggests a comparison, an analogy, or synonym)
      (repeat instruction)
   e. Optional:
      Now, if you wish, go back and give a title to what you have written.
   f. Congratulations. You have just written a poem about the stump or whatever you wrote about.
3. Have people read their writings if they wish.

VI. TRANSFERRING THE PROCESS TO OTHER ENVIRONMENTS

This could be done back inside, depending on outside condition. The same processes could be used to investigate other environments.


TASK F:

List some other things in this environment that could help us further interpret the forest.

Things in the forest | What it can tell us about the forest?

Identify and list some of the methods and processes we used today in our investigation.

Describe how we could use these methods and processes in another environment to find out more about it (city, schoolyard, etc.).

VII. SUMMARY DISCUSSIONS

1. Discuss TASK F.
2. "What did we find out about the environment in our session today?" (List on chart, if time)
3. "How are these things important to the way we manage the environment?"
4. "How can we summarize our investigations and discussions today?"
5. You may want the group to describe in writing how they felt about this session.

Lifting
Extending
Time to think
Summarizing

VIII. SOME OBJECTIVES

Behavioral Outcomes in Knowledge

As a result of these activities, you should be able to:

List at least 3 observations about the cross sections provided, and infer possible reasons for each observation.

Describe ways to set up an investigation to find out more about the above observations and inferences.

Set up an investigation (collect and record data) to find out reasons for growth rate differences in a given stand of trees.

Describe activities appropriate to other environments for interpreting the landscape.

Identify and list at least 3 evidences of change in the environment, and infer the cause-and-effect relationships of those changes.

Construct a diagram of a cycle in a rotten stump.

Behavioral Outcomes in Feelings, Awareness, Values, and Action

As a result of these activities, you should be able to:

Describe how you feel about one change in this environment.

Communicate feelings of awareness by constructing a sketch of a given object in the environment, using natural materials.

Communicate feelings, awareness, and values by describing in writing the effect of a given object on the environment.

IX. EQUIPMENT NEEDED

30 cross sections of trees
6 increment cores (preferably in plastic) from numbered trees
30 hand lenses (optional)
30 pieces sketching paper
lab sheets
task cards
natural materials for sketching

This lesson plan was developed for use in environmental workshops in 1971 and revised in 1975. Those people who developed and revised this plan include Martha Neyland, Snoqualmie, Washington; Jeannie Williams, Albany, Oregon; and Charline and Ernie McDonald, Portland, Oregon.

The tasks and discussion topics in this lesson are designed so that many can be done individually or in combination depending upon the facilitators objectives and time constituents.

*The discussion skills listed are examples of those necessary to carry out the lesson. Additional information on discussion skills are in the Lesson Plan for Developing Environmental Investigations in this series.

It is suggested by the writers that continuous revision take place by people who use this plan.

a lesson plan for:

SOIL INVESTIGATIONS

Set the stage for this investigation by reviewing quickly what will take place in the allotted time. For example: "In this session we will develop some skills in collecting and interpreting data about soil environments. We will then apply that data in making some decisions about how to use this land."

I. DESCRIBING SOIL

Distribute TASK A and have the group complete it before going to the study site (5 minutes)

TASK A: Work by yourself.

Write your own description of soil. Keep this description for reference later.

II. OBSERVING AND RECORDING THINGS IN THE SOIL

Distribute TASK B cards. (15 minutes) Have participants do Task B, No. 1 before going to study site.

TASK B: Work in small groups.

1. Predict what you will find in the top few inches of the area to be studied. List your predictions:

2. Select an area about 2 or 3 feet square on the ground and sift through the top 3 inches, recording the evidence of plants and animals you observe. Replace the ground in as near original condition as possible.

Name or Description of Item in the Soil	Quantity	Possible Effect on Soil

3. The terms: litter, duff, humus, are used to describe organic matter at the top of the soil. From your study above, complete the following chart:

Term and definition	Describe the feel	List the identifiable parts of plants and animals you found
Litter (identifiable dead things on surface)		
Duff (partially decomposed organic matter - compacted		
Humus (almost completely decomposed non-identifiable organic matter)		

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*Discussion Skills

Questions and discussion:

Discuss the terms litter, duff, humus - have participants actually pick up samples of litter, duff and humus from the area they're standing on.

1. What did you find?
2. How do you think the organisms you found affect the soil?
3. What might be some reasons for the odors in the soil?
4. Under what conditions would you expect to find more or different organisms?

Accepting
Clarifying
Extending
Time to think
Refocus

III. DEVELOPING THE SKILLS TO COLLECT SOIL DATA

Move the group to a soil profile or soil pit.

Questions and discussion:

1. What do you see as you look at this cross section or profile of soil?
2. What are some things we might want to find out about this soil?

Acceptance
Supporting
Encouraging

Comment to the group, "The various conditions and characteristics of soil that you have mentioned, such as color, texture, structure, temperature, and the acidity and alkalinity (pH) affect the way land can be used. Knowledge of these conditions is essential to land use planning whether in a forest or in your backyard. We are going to collect, record, and analyze some information about those soil characteristics." Distribute TASK C and refer to instructions on the back side.

Note to facilitator: Discuss and demonstrate how to collect data about the following soil characteristics using the instructions on the back side of TASK C. This instructional session is extremely important. The participants need the skills they develop in this session when they collect data for the micromonolith. Demonstrate and discuss what you are doing as you proceed, and draw on the participants for most of the observations. For example in demonstrating texture you may want to have samples of sand, loam, and clay in cans. Have participants feel these samples before determining the texture of the soil layers in the profile. You may want to demonstrate the use of the pH kit in front of the whole group. Use some foreign material like cigar ashes, a rotten log or coffee.

IV. CONSTRUCTING A SOIL MICROMONOLITH

Refer to TASK C. Explain that there is a place to check or record the data collected and a place to sketch how the soil looks. (45-60 minutes)

Note: Display the materials (jars, jelly cups, baggies, etc.) available and demonstrate how they are used to construct a micromonolith.

TASK C: Work in small groups or by yourself.

Using the information on the back of this task, and the available equipment, record your observations below. Make a micromonolith using the materials provided.

Sketch your soil profile, label the layers or horizons, and record the data.

DATA

PROFILE SKETCH

Soil temperatures
3" above surface_____ Just along surface_____
Contents of layers above top soil (if existing):
Litter - _____
Duff - _____
Humus - _____
Total depth of layer above top soil _____

Topsoil (A Horizon)
Depth_____" to _____", Color_____
Texture: Sandy_____, Loamy_____, Clayey_____
Structure: Columns_____, Blocky_____, Platy_____
Granules_____, pH_____, Temp_____, _____,
Plant Roots Visible_____.

Record below the same information for the other layers.

Describe type of rock in the bedrock (if present)

_____
_____
_____

Here are some ways to collect information about different soil characteristics.

1. soil layers (horizons)
Mark where the soil changes color and general appearance. Many soils have 3 major layers or horizons; i.e., top soil, subsoil, and parent material. Because soil formation has many variables, you may find more or fewer layers.

2. color
Describe the color of each major layer, using your own descriptive terms. Moisten soil to get a more accurate color description.

3. texture (how the soil feels)
Determine the texture of each major layer.

Texture is determined by feel. Rub a moistened sample of soil between thumb and forefinger. Spit on sample to moisten, if water is not available.
If it feels very gritty and not plastic----------sandy
If it feels smooth and slick, or somewhat gritty & sticky----loamy
If it feels smooth, plastic, very sticky----------clayey

4. structure (how the soil is put together in geometric shapes)
Determine the structure of each major layer.
Carefully break apart a shovelful of soil from each layer and match its characteristics with one of these structure words: blocky, platy, columnar, granular.

5. temperature
Determine the temperature of each layer. Use the soil thermometer.

6. pH (acidity or alkalinity).

Determine the pH of each major layer. Soil pH is an indication of how well certain plants can grow in the soil.

Put a small sample of the soil to be tested in a porcelain dish. Do not touch the sample. Use just enough pH reagent to saturate the soil sample. Match the color of the pH reagent at the edge of the soil sample with pH color chart.

Each person should construct a soil micromonolith. (TASK C) A micromonolith is a small model of a soil profile in which samples of each soil layer are attached to a card.

After finishing TASK C, distribute TASK D (20-30 minutes) - Discuss this task by reading the instructions with the whole group and going over the first task on soil depth.

Note: It may be important to have local plant identification books - picture keys, etc. - to use by participants in interpreting the soil pH - plant species tables in TASK D.

TASK D

Work in small groups or by yourself.

Using the soil data you collected and the information provided in the soil data tables included in this Task, complete the following:

1. Based on soil depth, complete the following (Refer to Table 1):
   The potential of my soil for water storage is _____
   Why? _____

2. Based on color, complete the following (Refer to Table 2):
   a. The top soil, or A horizon:
      amount of organic material _____
      erosion factor _____
      fertility _____
   b. The drainage in the subsurface soil or _____ is: _____

3. Based on the texture complete the following (Refer to Table 3):

Layer or horizon	Water holding capacity	Looseness of soil
Topsoil A		
Subsoil B		

4. Based on the structure complete the following (Refer to Table 4):

Layer or horizon	Penetration of Water	Drainage	Aeration
Topsoil A			
Subsoil B			

5. Based on the pH ranges complete the following (Refer to Table 5):

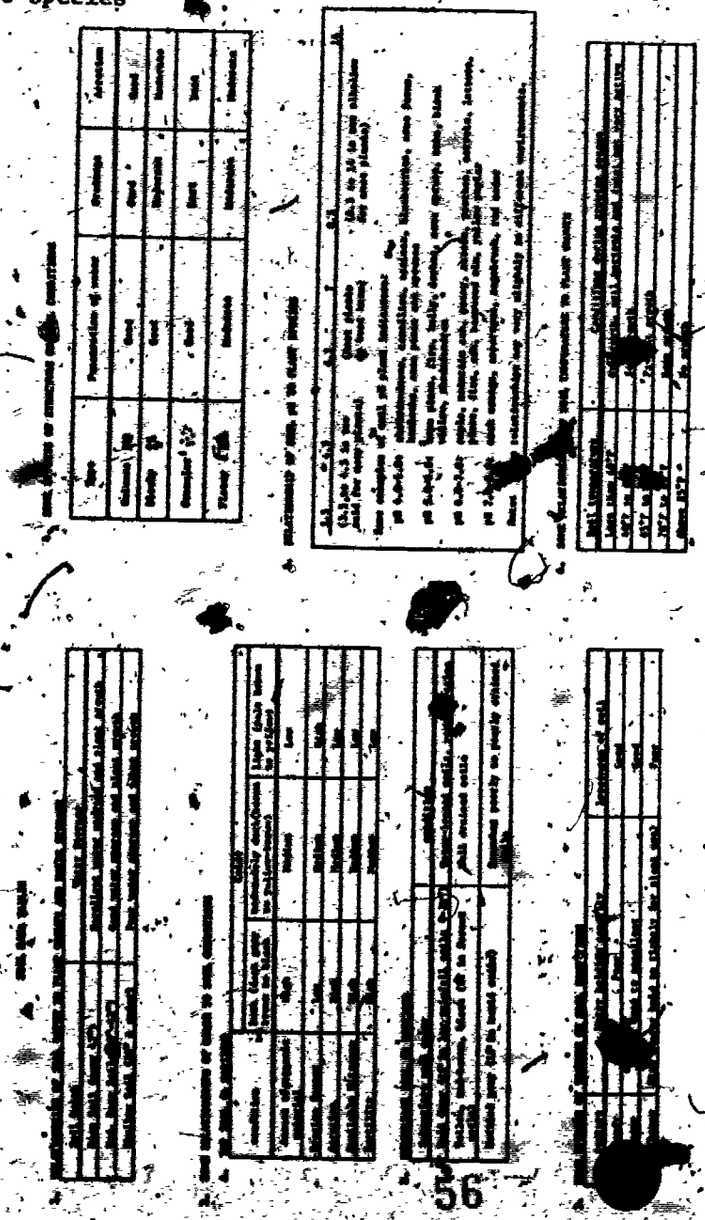
Some plants that could grow here based on the soil pH plant chart	Some plants actually observed growing here

How well did the plants in the study area check out with the pH you measured?

Describe in a short paragraph how you would set up an experiment to collect data and construct your own soil-pH plant chart.

6. Based on the soil temperatures complete the statement below (Refer to Table 6):
   The plants on my soil have _____ growth taking place now. In 3-months I predict that the growth conditions of the soil based on soil temperature will be _____
   The growing season (frost free days) in this area is about _____ days.

7. Write a soil description about this soil using the words from the data you collected and recorded on the soil misfortunelith card. Compare this description with the one you wrote at the beginning of the session.



Questions and Discussion

Accepting
Clarifying
Extending
Refocus.

1. Using the observed color of the top layer and Tables 2A and 2B, what did you say about the erosion factor of your soil?
2. Using the structure of your soil and Table 4, what did you say about the drainage of water?
3. How well did the plants in the study area conform to the soil pH - plant chart?
4. Have groups read how they would set up their own soil pH - plant chart. Point out that soil scientists determine soil pH and record the plants growing in the area to construct a table or chart for use in interpreting soil pH - plant relationships elsewhere.
5. If there is a Soil Conservation Service soil survey report describing local soils available, read its description of the soil just studied. Point out that these reports are prepared from the same information we used. Compare the Soil Conservation Service's description with the participants' descriptions. (Usually the descriptions are very similar.)
6. How does this soil description differ from the one you wrote in TASK A.

VI. MEASURING SLOPE OF THE LAND

Discussion

In addition to the other data we have collected, measurements of the slope of the land are needed in order to discuss possible uses of the study area. If the slope is varied, measurements from several locations may be needed to obtain a more accurate average.

Pass out TASK E: (10 minutes)

TASK E

Determining the slope of the Land:

1. Select a place that represents the average slope of the land being studied or take several measurements and average them.
2. Place one end of a 100" stick on the slope you want to measure? Hold stick so it is about level.
3. Place a level or jar with some liquid in it on the outright stick. Raise or lower the stick until level.
4. Measure the number of inches the free end of the stick is off the ground.
5. The number of inches is the slope of the land in percent.
6. Repeat the above steps in several different areas to get an average slope of the land being investigated.

Note: If you use a different length stick, then correct by using the conversion table below.

CONVERSION TABLE

Stick length (inches)	Distance the end of the stick is above the ground (inches)	multiply by conversion factor	slope (percent)
100"		X 1 =	%
50"		X 2 =	%
25"		X 4 =	%

The average percent slope of the land measured is _____%

DETERMINING POSSIBLE LAND USES

Using the soil data you have collected, the slope measurements, and the Land Use Data Table, determine a land classification and possible use(s) for your study site. See TASK F.

TASK F (Work in small groups)

DETERMINING POSSIBLE LAND USES

There's great diversity of land uses requires different sets of criteria that analyze a variety of soil and land factors in different ways. These factors must be considered in determining the most appropriate land use for a given area. The most limiting soil factor will be the major influence in determining the best use of the land. See Land Use Data Table for definition of limiting soil factor.

Using the data from TASK E and the Land Use Data Table, answer the following questions.

According to the Land Use Data Tables, this land could be used for:

Agriculture use:
(list and explain why)

Occupancy: Land uses

Roads and streets

Building sites

Septic tank filter fields

Picnic and camp areas

I feel the best uses of this land would be:

because -

LAND USE DATA TABLES

Agricultural uses

Directions: Circle the item in each of the 5 columns below that best describes each of the 5 soil factors in the soil you studied. The most limiting soil factor will determine the best agricultural use of the land. A limiting soil factor can be defined as something that will restrict the use of land for desired activities. The most limiting factor indicates the most appropriate agricultural use.

Soil Factors					Agricultural Uses
Slope	Erosion hazard	Soil depth	Drainage	Texture	
0-3	None	Deep	Well drained	*Loam or silt loam	Farm crops—cultivation good soil mgmt. practices
3-20	Slight to moderate	Mod. deep	Somewhat poorly	Sandy loam or silty clay	Farm crops-few to several special cultivation practices
20-30	Severe	Shallow	Poor	Sand or clay	Occasional cultivation, many special practices
0-3	None to slight	Deep	Well to poor	Stony	Pasture-woodland cultivation no machinery can be used
30-90	Very severe	Deep to shallow	Well to poor	Sandy, Loamy, Clayey or Rocky	Pasture, timber growing, woodland, wildlife, no cultivation machinery
All	None to extreme	Deep to shallow	Excessive to poor	Rockland, river wash, sand dunes	Wildlife, recreation

*loam is a combination of sand, silt and clay particles

Occupancy land uses

Select the most limiting factor for each land use and record the overall limitation (slight, moderate or severe) on TASK F.

Land uses & factors affecting that use	Slight Limitation	Moderate Limitation	Severe Limitation
Roads and Streets Slopes Depth Bedrock	0-12% Over 40" Over 20"	12-30% 20-40" 10-20"	Over 30% Less than 20" Less than 10"
Building Sites Slopes Depth Bedrock	0-12% Over 40" Over 30"	12-20% 20-40" 20-30"	Over 20% Less than 20" Less than 20"
Septic Tank Filter Fields Slope Depth Watertable depth below trench	0-7% Over 6' Over 4'	7-12% 4-6' 2-4'	Over 12% Less than 4' Less than 2'
Picnic and Camp Areas Slope Stones Bedrock during season of use	0-7% 0-25% Over 30"	7-12% 25-50% 20-30"	Over 12% Over 50% Less than 20"

Questions and Discussion

Clarifying
Extending
Lifting
Time to think
Refocusing

1. What recommendations did you make on TASK F?
2. How do you feel about the present use of this land?
3. How could man improve the use of this land?
4. What are some uses which could damage the land? What environmental precautions should be taken to minimize the damage?
5. How do the things we've done so far relate to making land use decisions?
6. How do social, economic and political factors affect the development and use of the land?
7. What are some long-range effects of land use decisions on our society?

III. COMMUNICATING FEELINGS, AWARENESS, AND VALUES ABOUT SOIL

Distribute TASK H (10 minutes)

TASK G

Describe how you feel about man's effect on the soil environment where you live.

Describe what you can do to improve the use of the soil:

In your backyard -

In your community -

Ask for responses from TASK G, and discuss.

IX. SUMMARY QUESTIONS

Lifting
Extending
Time to think
Refocus
Summarizing

1. What did we find out about the environment in our study today?
2. How are soil characteristics important in environmental management?
3. How can we summarize our discussions and investigations?
4. You may want the participants to evaluate the session by writing how they felt about it.

X. SOME OBJECTIVES

Behavioral Outcomes in Knowledge

As a result of this session, participants should be able to:

Describe three ways in which the living organisms in the top part of the soil affect the soil.

Construct a soil micromonolith of an assigned soil profile, determine and record texture, structure, pH, temperature, and color of each layer.

Write a description of a soil studied, using the words they recorded about that soil on their micromonolith.

Demonstrate the ability to determine the best uses of the land in this area, using the data from your soil micromonolith and the land capability charts.

Describe three things that man does to determine the proper management of soil resource.

Behavioral Outcomes in Feelings, Awareness, Values, and Action

As a result of this session, participants should be able to:

Describe how they feel about man's effect on this soil environment.

Describe how they feel about man's effect on the soil environment where they live.

Describe what they can do to improve the use of the soil:
in their backyard:
in their community:

XI. EQUIPMENT NEEDED: (for a class of 30 people)

6 La Motte soil pH kits	*100 jelly cups and lids/etc	3 staplers
30 micromonolith cards	3 soil thermometers	1 box staples
6 tape measures	2 #10 cans of water	2 shovels
30 sets of lab sheets	30 hand lenses	3 yardsticks
3 sticks (50" or 100" long)	3 baby food jars, 1/2-full of water	

Samples of sand, silt, clay (optional)
Plant samples, drawings or guides to use with soil pH-Plant relationship chart (optional)

*other materials such as baggies, seran wrap, pill bottles, etc have been used satisfactorily.

This lesson plan was developed for use in teacher workshops in 1971 and revised in 1974. The people who developed and revised this plan include: Phyllis Enger, Seattle, Wash.; Dave Kennedy, Olympia, Wash.; Don Cannard, Vancouver, Wash.; Ernie McDonald, Portland, Ore.; George Otte, Hillsboro, Ore.; Bert Bray, Atlanta, Georgia; Ron Greenwald, Washington D.C.; Alice Cook, Juneau, Alaska.

The tasks and discussion topics in this lesson are designed so that many can be done individually or in combination depending upon the facilitators objectives and time constraints.

*The discussion skills listed are examples of those necessary to carry out the lesson. Additional information on discussion skills are in the Lesson Plan for Developing Environmental Investigations in this series.

It is suggested by the writers that continuous revision take place by people who use this plan.

A LESSON PLAN FOR NATURAL RESOURCE UTILIZATION IN AN URBAN ENVIRONMENT

Set the stage for this investigation by reviewing quickly what will take place in the allotted time. For example: In the next four hours we will investigate our use of natural resources. We will discuss the origins of natural resources, how natural resources are used, environmental issues related to resource use, and the management of natural resources. (You might want to read the behavioural objectives at the end of the lesson and refer back to them as an evaluation of the session.)

I. NATURAL RESOURCES

TASK A: (5 minutes) Work by yourself.

Write your own definition of a natural resource.

Questions and discussion:

1. What are some definitions of a natural resource? (Accept all answers)

Distribute TASK B cards and objects. (Rock, water, soil, etc. Objects may be just about anything, but there should be a large variety.)

TASK B: (5 minutes) Work by yourself or with another person.

1. List all possible uses you can think of for your object.

2. For a large amount of your object.

3. For any part of the object.

Questions and discussion:

1. What are some of the uses of your object?
2. Which of the objects seems most important to you?
3. Choose one object you feel you could do without. Why?

TASK C: (10 minutes) Work by yourself.

Write your own definition of a renewable resource.

Write your own definition of a non-renewable resource.

Working in small groups, classify the objects used in TASK B. Which are renewable and which are non-renewable?

Write a short explanation of the classification of each object.

OBJECT	RENEWABLE	NON-RENEWABLE	REASONS

Questions and discussion:

1. What are some ways you can distinguish between renewable and non-renewable resources?

2. What values are there in distinguishing between the two types of resources?

TASK D1: (15 minutes) Work in groups of 2 or 3.

Take a walk down one nearby block, listing all natural resources that have been used there. After each natural resource write how it is used, whether it is renewable or non-renewable, and the relative quantity of it on the block.

NATURAL RESOURCE	HOW USED?	RENEWABLE	NON-RENEWABLE	RELATIVE QUANTITY

Distribute flip-chart paper, marking pens, etc.

TASK D2: (15 minutes) Work in groups of 2 or 3.

Make a visual display of the uses and relative quantities of natural resources found in TASK D1. Make the display any way you want.

Questions and discussion:

1. From our investigation so far, what can we say about the resources we use.

Distribute local phone books, if available.

TASK E: (60 minutes) Work in small groups.

Choose 3 natural resources from TASK D1. Find out if these resources are available in the community. Where can they be bought, where do they come from, what do they cost, etc.

Questions and discussion:

1. What did you discover in TASK E about the natural resources you chose?

2. What methods did you use for gathering information for TASK E?

3. Thor Heyerdahl has written: "Modern man seems to believe he can get everything he needs from the supermarket and corner drugstore. He doesn't understand that everything has a source in the land or sea, and that he must respect these sources." How do you feel about this statement?

4. This belief that everything comes from the supermarket has been termed the "supermarket syndrome". In what way does the "supermarket syndrome" affect our attitudes and beliefs about natural resources?

TASK F: (20 minutes) Work in small groups.

Identify 5 urban environmental issues concerning natural resource utilization in this community. For each issue list the natural resources involved.

ISSUE	NATURAL RESOURCES INVOLVED
1.	
2.	
3.	
4.	
5.	

Choose one issue from above, and trace the natural resources involved back to their source in the environment.

Questions and discussion:

1. How is the issue you have selected related to the "supermarket syndrome"?

TASK G: (10 minutes) Work by yourself.

Describe in writing 3 things you can do in your everyday life to overcome the supermarket syndrome.

Select the one you think would be your best contribution. Describe the benefits of this action:

a. Where you live: _____

b. In your consumer habits: _____

c. Other benefits: _____

Questions and discussion:

1. What can you do back home to overcome the supermarket syndrome?
2. How do you feel about resource use in your community?

II. MANAGEMENT OF NATURAL RESOURCES

Pre-Investigation question:

1. What does management of natural resources mean to you?

TASK H: (10 minutes) Work by yourself or in groups.

List some natural resources of this state, and how they are used. Keep in mind the major products, industries, and businesses of the state.

NATURAL RESOURCES	HOW USED

Questions and discussion:

1. What are some natural resources found in this state? (Write all responses on flip-chart paper.)

2. Which of the natural resources are similar? (Group those that are similar -- A, by all of one group, B, by the next, etc.)

3. What word can we use to label each group of resources?

4. Are there any other resource categories that we should add? (Divide the large group into small groups, one group for each resource category. Assign each group category, and hand out highway maps to each group.)

TASK I: (15 minutes) Work in groups.

Locate on your map where your assigned category of resources can be found. Draw boundaries around these areas on your map. Then mark your boundaries on the master map. Each groups should use a different color marker.

Questions and discussion:

1. What resource category boundaries overlap?
2. What problems occur when boundaries overlap?
3. In what ways are management guidelines important in managing natural resources?

TASK J: (10 minutes) Work by yourself.

Write some management guidelines you think are important in managing natural resources.

Questions and discussion:

1. What are some of your guidelines? (Write all answers on flip-chart paper.)
2. Which of the guidelines are similar? (Group those that are similar -- A by all of one group; B by the next, etc.)
3. To develop some general management guidelines, what words can we use to label each group of guidelines?

TASK K: (20 minutes) Work in groups.

Using the general management guidelines, develop a management plan for all the resource categories. Prepare a 5-minute presentation for your management plan.

Questions and discussion:

1. What difficulties do natural resource managers have?
2. What can we say about natural resource management in this present year?

Summary questions and discussion:

1. What influence does the urban environment have on natural resource use?
2. How is the often heard statement "there is no such thing as a free lunch" related to natural resource use and management?
3. What can we conclude about natural resource use today?
4. What can we conclude about resource management today?
5. How can we summarize our discussions and investigations?
6. What methods and processes did we use in our investigation?

TASK L

Describe in writing how you feel about our session today.

BEHAVIORAL OUTCOMES IN KNOWLEDGE:

As a result of these activities, you should be able to:

1. Identify uses of natural resources for our environment.
2. Identify renewable and non-renewable resources.
3. Trace resources used in everyday items to their original source in the environment.
4. Identify patterns of resource utilization which involve urban environmental issues.
5. Identify the need for active natural resource management guidelines.
6. Develop a natural resource management plan using management guidelines.

BEHAVIORAL OUTCOMES IN FEELINGS, AWARENESS, VALUES AND ACTION:

As a result of these activities, you should be able to:

1. Describe how you feel about resource use in your community.
2. Describe what you can do to improve resource utilization in your community.
3. Describe how you feel about natural resource management.

EQUIPMENT NEEDED: (for a class of 30 people)

30 natural objects (rock, water, soil, etc., objects may be just about anything, but there should be a large variety.
1 large map of state.
10 highway maps of state.
1 flip chart.
10 magic markers (variety of colors).
5 local phone books.

This lesson plan was developed for use in teacher workshops by:

John A. Taylor; Laramie, Wyoming
Gary Severson; Denver, Colorado
Lolita Robinson; Denver, Colorado
John Strickler; Manhattan, Kansas

It is suggested by the authors that continuous revision take place by people who use the ideas.

A LESSON PLAN FOR INVESTIGATING AN URBAN COMMUNITY

During this session we will identify parts of an urban community, look at the pattern of land use, construct a procedure and plan to investigate, one part of the community, analyze the data collected, develop alternative solutions to present conditions, and develop a plan to implement your solutions or recommendations.

Overview of the Process

The procedure outlined in this process falls into nine basic steps or phases. They are:

I. BECOMING FAMILIAR WITH THE COMMUNITY

Questions and Discussions

A. What are some major land use categories found in most urban communities? (List on board e.g., commercial, residential, recreation, industrial, etc.)

B. Pass out map of local community being studied. How each group locates the major land use categories from A plus others they can think of on the map and with magic markers, etc.

TASK A In groups of 3-4. 10-15 minutes

Working in groups, locate the major land use categories on the map of your community.

II. IDENTIFYING AND FOCUSING ON LAND USE PATTERNS, INTERRELATIONSHIP OR PROBLEMS TO INVESTIGATE

A. After looking at your map and locating the land uses on it, what can you say about the pattern of land use in your community? List on board.

NOTE: Here are two additional options to consider using after II A depending upon the objectives of your plan.

Option A - If your objective is to investigate environmental factors, then use this question after II A:

- What are some factors that might affect the quality of the environment of the area on this map? (List factors on chart.)
- In small groups, complete following chart.

Factors from above	In what ways will they affect Env.

- One tool that will help in your task of developing an investigation is to construct a 3-stage data collecting chart.
- After doing the chart (III analyze the investigation), have group go right to IV B and tell them to "Select one of factors from above and fill out column 1 of Task B.
- Proceed with rest of lesson.

Option B - If your objective is to investigate a potential or existing problem then ask this question after II A, "What are some problems that might be created by the pattern of land use in your community?" Proceed with III of the lesson, but make sure to orient the rest of the instructions to the problem.

B. One task is to construct a collecting and recording chart to use in your investigation.

C. One tool that can help you in your task is to construct a 3-stage data collecting chart to assist in analyzing the investigation.

D. We want to do one with you as a sample.
NOTE: (Pick a subject other than a land use category listed on the board to illustrate the use of the chart.)

E. NOTE TO INSTRUCTOR:
1. Here are the steps in doing a sample 3-stage chart with the whole group.
2. Let's pick transportation as the topic to be investigated. (Write transportation at the top of chart.)
3. The first column is labeled, "What We Want to Find Out" about the topic. (Write that at far left of board and ask for group responses.)
4. The second column is labeled, "How to Collect" information about the item listed in Column 1 (write that heading next to column 1 and ask for group responses. Ask for ways to collect information on the first 4 to 5 items in Column 1, one at a time, then ask are there any additional ways you can think of to collect information).
5. The third column is labeled, "How to Record" the information we are going to collect. (Write that heading next to column 2 and ask for group responses. Just ask for general ways to record the information for any item).

NOTE: Here is what the sample chart might look like after doing it with the total group.

Sample — 3-Stage Data Collecting Chart
Subject: Transportation

Column 1 What We Want to Find Out	Column 2 How to Collect	Column 3 How to Record
Location of major arterials	Observation	Graphs
Kinds of transportation	Interview people	Statistics
What is needed	Existing studies	Pictures
How much is available	Count # of cases at certain place	Film
Accessibility of terminals	Count types of vehicles	Tape recorders
Land topography		Questionnaire
Is it working		Map
What is being used now		Tables
Growth pattern		
Traffic flow pattern		
Peak traffic need		
Attitude of People		

DISCUSSION:
What might be the benefits of analyzing a land use, a topic or an issue this way before going out to do an investigation about it?
(Stick with this discussion until they say stuff like:
- It's easier to see all the parts of the topic.
- Analyzing it breaks it down into manageable parts to study.
- You realize that problems aren't as simple as they seem.

III. IDENTIFYING AND ANALYZING THE TOPIC FOR YOUR INVESTIGATION

Questions and Discussions

A. Describe the area that the group is going to investigate and have each person draw that area on his map.

Criteria for the facilitator to use in identifying an area to investigate.

1. Within walking distance in the time segment allotted (3 hours of field investigation).
2. Have a variety of land use categories.
3. Have example of changing land use.
4. Should be interesting to study.

Split class into appropriate number of study teams, (mix class up) and assign a land use category.

B. Identify the land use category you are going to investigate and fill out column 1 of the 3-stage chart in Task B.

TASK B 20 minutes. Working in your group (3-6) Fill out the land use category and column 1 of the chart below.

3-Stage Data Collecting and Analyzing Chart

Land Use Categories _____

Column 1 What we want to find out about our land use category in the area	Column 2 How to collect the information	Column 3 How to Record the Information

C. Now, select one or two items from the first column of your chart and do TASK C:

TASK C 30 minutes (in small groups)

Identify one or two items from the first column of your chart and construct a sample data collecting and recording device for each item selected. The data collecting and recording devices must be with data that is observable, collectible, and recordable in the environment during the actual field investigation.

D. Now do TASK D.

TASK D 30 minutes

Develop a plan of action to investigate your part of the environment using the data collecting and recording devices constructed in TASK C and in the allotted field time. (Consider dividing responsibilities for collecting and recording information, who goes where, other tools needed, etc.)

NOTE: After 10 minutes into TASK D, put up and read the following sign.

Planning for an Investigation

Usually, the problems that people have are 1) deciding what to do, 2) narrowing down the scope of the topic to something specific enough to actually investigate. HAS YOUR GROUP EXPERIENCED THIS?

E. After TASK D
Each group make a short presentation to describe the procedures and display the recording devices to be used in the investigation. If class is over 40, then have groups pair up and critique each other's plans instead of each small group presenting it to total group.

NOTE: Just before dismissing the groups to do the field investigation, put up the following chart.

This Session is all About Learning How to Prepare for an Investigation

Today the procedures are more important than the content. The idea is to try out your data-collecting and recording methods.

It may be necessary to modify your investigation procedures as you become involved in your task.

IV. CONDUCTING THE INVESTIGATION

Tell group: You now have three hours to do your field work. Be back here at _____ time. You will have one hour to prepare a 10-15 minute report about your investigation. Instructions for the report will be posted when you return.

V. REPORTING ON THE INVESTIGATION

Have following instructions up as groups come back so they have some guidelines for their presentation.

TASK E — Instructions for the Presentation

1. Describe your task.
2. Report on what you did, how you did it, and what it meant.
3. Describe how you modified your procedure, methods, recording devices, etc.
4. Use more than one person as spokesman.
5. Use visual displays.
6. Limit report to 5-10 minutes (5 minutes if more than 5 groups).
7. This report is to report on the investigation process and not the content or solutions to problems.

NOTE: Each group gives their presentation. Stick to time limits and to the process of the investigation.
What problems did you encounter in your investigation?
What is the next step to do with all this information?

VI. ANALYZING FACTORS AND ALTERNATIVES TO THEIR PRESENT CONDITIONS

Questions:

A. What are the basic functions of your study area? Whole community?
B. What are some of the needs of the area?
C. What impact does your survey area have on the management of your community?
D. What would happen if one whole segment of the community were eliminated? One category?
E. What are some "focus words" (Themes) that could be used to further study this area? (change, repetition, continuity, interdependence, etc.).
F. What examples are there in your area that:
   illustrate the past--
   typify the present--
   indicate the future--
G. What interrelationships can we identify in the area investigated based on your field observations (residential to business, past use to present use, business district to transportation routes, etc.).
H. How do these things above affect the function of the community? (vacancies affect appearance, business taking over community, apts. affect community spirit, etc.).
I. What are some of the most obvious problems?
J. Select one issue, concern, or problem that you identified in your investigation. Using TASK F, list, and analyze all the factors you can

TASK F - ANALYZING FACTORS AND ALTERNATIVES TO PRESENT CONDITIONS

(TASK F is designed to brainstorm all possible alternatives.) List the factors cont
Take each factor and ask: "How can we change this factor (eliminate, modify, substi
a change in the issue?" Consider all alternatives, no matter how silly they may see

FACTOR	HOW IT CONTRIBUTES TO THE PROBLEM OR ISSUE	ALTERNATIVES TO ITS PRESENT CONDITION Select one or more alternatives below and describe how the factor might be changed (Elimination Modification Substitution)	DESC WILL OR I
Example: Traffic Management			
Width of streets	Cause traffic jam	Put in walking or bicycle paths	Elim chan patt
		One-way streets	Ease one-
		Mass transit	Min no poll
Everyone start and quit work at same time	Cause traffic jam	Adjust starting, closing, working hours	Spre long

Describe the alternative or combination of alternatives that might bring about an improv
the quality of the environment investigated. Give reasons for your choices.

After you have analyzed the factors in TASK F, then go on to TASK G.

II. DEVELOPING ACTION PLANNING TO BRING ABOUT AN IMPROVEMENT OR SOLUTION TO THE ENVIRONMENT INVESTIGATED

Select one of the alternatives from TASK F. Write it in TASK G under suggested solution and complete the task. This can help you determine if your solution is feasible or not and what course of action you plan to take for its implementation.

TASK G DEVELOPING ACTION PLANNING TO BRING ABOUT AN IMPROVEMENT OR SOLUTION TO THE ENVIRONMENT INVESTIGATED

Select one of the solutions suggested by your group in TASK E. Write it below under "Suggested Solution" - Complete the rest of the chart.

ACTION PLANNING FOR PROBLEM SOLVING

SUGGESTED SOLUTION	TYPE ACTION NECESSARY TO IMPLEMENT THE SOLUTION	IDENTIFY CHANGE AGENTS WHO COULD HELP IMPLEMENT THE SOLUTION	IMPLEMENTATION STEPS TO PROBLEM SOLUTION	EVALUATION METHODS-HOW WILL YOU FOLLOW UP AND EVALUATE THE EFFECTIVENESS OF YOUR ACTION?
(Write in Solution suggested by your group in Task D)	Technological What kinds of technological action would be necessary to implement this idea?	Individual What kinds of things could be done through individual action?	(What must be done?--in what order?--when? Steps Target Date 1. 2. 3.	
	Social What kinds of social action would be necessary to implement this idea?	Groups What kinds of things could be done by/through groups? Informal Formal (organizations)		
	Political What kinds of political action would be necessary to implement this idea?	Agencies What kinds of things could be done by/through agencies?		

Questions:

A. Have group give reports on TASK G.
B. What are your recommendations for meeting future needs in this area?
C. If you were the city planning commission, what guidelines would you develop for consideration of future developments in this area?

VIII. COMMUNICATING FEELINGS, AWARENESS, AND VALUES

TASK H

Describe your part in implementing the action plan in TASK F--

- as a member of a community action group--
- as a part of the political decision-making process in your community

Questions and discussion:

A. Discuss individual comments.
B. What type of community action can we take to identify and motivate people, to collect, interpret data, arrive at alternative solutions and take intelligent action to decide on the best solution consistent with the needs of the environment and society.

IX. SUMMARIZING THE INVESTIGATION

A. As a facilitator you should help your audience PLAN.
B. You will need to help them: . Think through their procedures
. Anticipate possible problem.
C. The important thing is to identify:
1. What you want to find out.
2. How to collect.
3. How to record.
4. How to interpret (what does it mean)
5. Do something with your information.
D. What did we find out about the environment in our study?
E. How will this process help you when you have students investigate things or have community groups investigate things?
F. How are you going to immediately apply what you learned today?
G. How can we summarize our discussion and investigation?

TASK I

Describe in writing how you feel about our session today.

ADDITIONAL INFORMATION

The following laboratory sheets could be used to provide additional ideas to people investigating an urban environment. The group may identify different component parts of the environment than those listed here.

BEHAVIORAL OUTCOMES IN KNOWLEDGE

As a result of these activities, you should be able to:

Identify at least five different land use categories in an urban environment.

Construct a data collecting and recording tool for some part of an urban environment for data that is observable, collectible, and recordable.

Describe a procedure to use in initiating an urban environmental investigation.

Identify at least three component parts of an urban environment.

Describe four interrelationships that exist between component parts of the environment.

BEHAVIORAL OUTCOMES IN FEELINGS, AWARENESS, VALUES, AND ACTION

As a result of these activities, you should be able to:

Analyze factors and alternative solutions to present condition in an environment

Identify forces and change agents that can be used for or against the improved livability of the area.

Describe what you can do to become involved in community action programs of identifying and suggesting solutions to local environmental problems.

Describe how you and the community people can become involved in affecting the local political decision-making process through environmental urban investigations.

EQUIPMENT NEEDED

Maps of the urban area to be investigated
Blackboard or newsprint easel
Magic markers or chalk
Paper and pencils

This lesson plan was revised for use in teacher workshops in June 1973 by Charline and Ernie McDonald. It is suggested by the writers that continuous revision take place by people who use the ideas.

NOTE: The information and ideas on pages 12 to 18 can be used in formulating different aspects of the urban investigation.

LAND USE SURVEY

1. Inventory and plot on map

List the major uses of land in the area.
Group these uses into appropriate categories.
Label the categories.
Develop a legend for plotting this data on the map.

2. Additional Information

DEVISE YOUR OWN METHODS TO COLLECT AND RECORD THIS DATA. SUBMIT THE METHODS AND THE DATA, IN WRITING, TO YOUR GROUP LEADER AT THE END OF THE SESSION.

How does each land use affect the other land uses of the area?

What problems exist because of certain land uses?

What land use problems in this area are related to regional (Portland metropolitan area) environmental problems?

What things are being done to the land that are compatible with:
the characteristics of the land?
the needs of the people?

Which land uses are changing?

What proposed projects could affect land use patterns in this area?

NOTE: The above questions are designed to help you look for significant relationships between things in the environment. Time may not allow you to investigate all of the suggestions. Therefore, you will have to decide which things are most significant in the time allowed. Please feel free to add to the list, throw it away and start all over, etc.

Something to think about

For each of the land uses you investigate, ask yourself:
Is it in a good location to serve its purpose?
What does it do to the environment?
What kind of an environment does it have?

3. Summary questions on land use survey

See questions and discussions after TASK D.

TRAFFIC AND TRANSPORTATION SURVEY

1. Inventory and plot on map

List the major traffic routes in the area.
Group these routes into appropriate categories..
Label the categories.
Develop a legend for plotting this data on the map.

2. Additional information

DEVISE YOUR OWN METHODS TO COLLECT AND RECORD THIS DATA.
SUBMIT THE METHODS AND THE DATA, IN WRITING, TO YOUR GROUP LEADER AT THE END OF THE SESSION.

List the major user groups of each category in #1.

Which are the most heavily traveled routes?

What problems are associated with traffic and transportation in the area?

What is the effect of these problems on the rest of the study area?

What traffic and transportation problems associated with this area are related to regional (Portland metropolitan area) environmental problems?

What proposed projects could affect traffic and transportation patterns in the area?

NOTE: The above questions are designed to help you look for significant relationships between things in the environment. Time may not allow you to investigate all of the suggestions. Therefore, you will have to decide which things are most significant in the time allowed. Please feel free to add to the list, throw it away and start all over, etc.

Something to think about

For each of the traffic and transportation routes you investigate, ask yourself:

- Is it in a good location to serve its purpose?
- What does it do to the environment?
- What kind of an environment does it have?

3. Summary questions on traffic and transportation survey

See questions and discussions after TASK D.

COMMUNITY FACILITIES AND SERVICES SURVEY

1. Inventory and plot on map

List the community facilities and services in this area.
Group these facilities and services into appropriate categories.
Label the categories.
Develop a legend for plotting this data on the map.

2. Additional information

DEVISE YOUR OWN METHODS TO COLLECT AND RECORD THIS DATA.
SUBMIT THE METHODS AND THE DATA, IN WRITING, TO YOUR GROUP LEADER AT THE END OF THE SESSION.

List the user groups for each category in #1.

What reasons can you give for the locations of each of the community facilities and services you listed in #1?

What needs of the people are being met by these facilities and services?

What needs are not being met by existing facilities and services?

What problems are associated with the quantity and quality of community facilities and services in this area?

Which of these problems are related to regional (Portland metropolitan area) environmental problems?

What proposed projects could affect the use and effectiveness of community facilities and services in this area?

NOTE: The above questions are designed to help you look for significant relationships between things in the environment. Time may not allow you to investigate all of the suggestions. Therefore, you will have to decide which things are most significant in the time allowed. Please feel free to add to the list, throw it away and start all over, etc.

Something to think about

For each of the community facilities and services you investigate, ask yourself:
Is it in a good location to serve its purpose?
What does it do to the environment?
What kind of an environment does it have?

3. Summary questions on community facilities and services

See questions and discussions after TASK D.

ENVIRONMENTAL ASSETS AND LIABILITIES SURVEY

1. Inventory and plot on map

List the environmental assets of the area. (physical and visual)
Examples:
historic landmarks, visual impact structures, natural features, aesthetically pleasing entrances, etc.

List the environmental liabilities of the area (physical and visual)
Examples:
conflicting land uses, high traffic streets, residential overcrowding, poor paving, curbs, sidewalks, adverse natural features, sameness of environment, etc.

Group the environmental assets and liabilities into appropriate categories.
Label the categories.
Develop a legend for plotting this data on the map.

2. Additional information

DEVISE YOUR OWN METHODS TO COLLECT AND RECORD THIS DATA.
SUBMIT THE METHODS AND THE DATA, IN WRITING, TO YOUR GROUP LEADER AT THE END OF THE SESSION.

How do the environmental assets affect the rest of the area? (be specific)

How do the environmental liabilities affect the rest of the area? (be specific)

Which environmental assets have potential for serving as building blocks to improving the livability of this area?

What problems exist because of adverse environmental factors in the area?

What environmental problems in this area are related to regional (Portland metropolitan area) environmental problems?

What proposed projects could affect environmental assets and liabilities in this area?

NOTE: The above questions are designed to help you look for significant relationships between things in the environment. Time may not allow you to investigate all of the suggestions. Therefore, you will have to decide which things are most significant in the time allowed. Please feel free to add to the list, throw it away and start all over, etc.

Something to think about
For each of the environmental assets and liabilities you investigate, ask yourself:
Is it in a good location to serve its purpose?
What does it do to the environment?
What kind of an environment does it have?

3. Summary questions on environmental assets and liabilities

See questions and discussions after TASK D.

SOCIAL SURVEY

1. Inventory and plot on map

Collect information about the population characteristics of the area.
Age, income, education, size of families, renters-owners, length of residence, etc.

Develop a legend for plotting this data on the map.

2. Additional information

DEVISE YOUR OWN METHODS TO COLLECT AND RECORD THIS DATA.
SUBMIT THE METHODS AND THE DATA, IN WRITING, TO YOUR GROUP LEADER AT THE END OF THE SESSION.

What needs of the residents are met by living in this area?

What social problems exist in the area?

Which problems associated with this area are related to regional (Portland metropolitan area) environmental problems?

What changing conditions in the area are creating problems for its residents?

What proposed projects could:
affect the life-style of people in this area?
lead to a change in the population characteristics of this area?

What are the attitudes of the people in this area toward:
governmental and private services
citizen needs
overall quality of life in the area? (See attached opinion poll) (questionnaire)

NOTE: The above questions are designed to help you look for significant relationships between things in the environment. Time may not allow you to investigate all of the suggestions. Therefore, you will have to decide which things are most significant in the time allowed. Please feel free to add to the list, throw it away and start all over, etc.

3. Summary questions on social survey

See questions and discussions after TASK D.

SOCIAL SURVEY QUESTIONNAIRE

Note to person administering questionnaire:
Fill in the blanks with appropriate words, depending on the location and the purposes for which you are using the questionnaire.

1. I live in _____ at (cross-streets) _____.

2. Overall, _____ as a place to (live) (shop) is:

___ Very Good ___ Quite Good ___ Just Fair ___ Poor ___ Very Poor

3. What I like best about _____ is:

4. My biggest complaint about _____ is:

5. Here's what I think should be done about that:

MICRO-URBAN INVESTIGATIONS

In addition to major component parts or categories of an urban environment, there are many opportunities for small individual environmental investigations.

Investigations of this nature should be developed in writing along the same procedures as in TASK B, C, or E.

TASK ___

Develop in writing an investigation about some part of the man-made environment.

a. Describe procedures in action or process terms.
b. State objectives in behavioral outcomes that indicate some minimal expectations in acquiring new knowledge and skills.

Here are some suggested micro-urban environmental investigations:

1. Correlation of observable weather conditions to air pollution index.
2. Correlation of man-made sounds to noise pollution.
3. Effect of signs and billboards on sight pollution.
4. Effect of architecture on aesthetics.
5. Impact of local shopping center on community.
6. Supermarket Survey (packaging, buying habits).
7. Interpreting the man-made landscape using architectural styles, etc.
8. Observe and record life in a park.
9. Man's effect on watersheds through paving.
10. Under what conditions can plant life live in a blacktop environment.
11. Compare city downtown block to a residential block.
12. Determine the different responses of water holding capacity and runoff to different types of man-made surfaces.
13. Environment of a city tree.
14. Determine what is in a city block.
15. Noise pollution (determine where noises occur most frequently and determine city noises which can be reduced to minimize noise pollution).
16. An analysis of traffic past a given point.
17. Inventory and classify historic structures within the central business district of your hometown and determine necessities for their protection.
18. What will the effect of a four-day work week be on the community environment?
19. Does storm runoff from city streets contribute to water pollution?
20. Identifying factors and developing tools to help in recording and interpreting air pollution indexes in the local community.

This lesson was developed for use in teacher workshops by Charline McDonald, Portland, Oregon.

The lesson plan was revised in May 1973. It is suggested by the writer that continuous revision take place by people who use the ideas.

SIMULATIONS

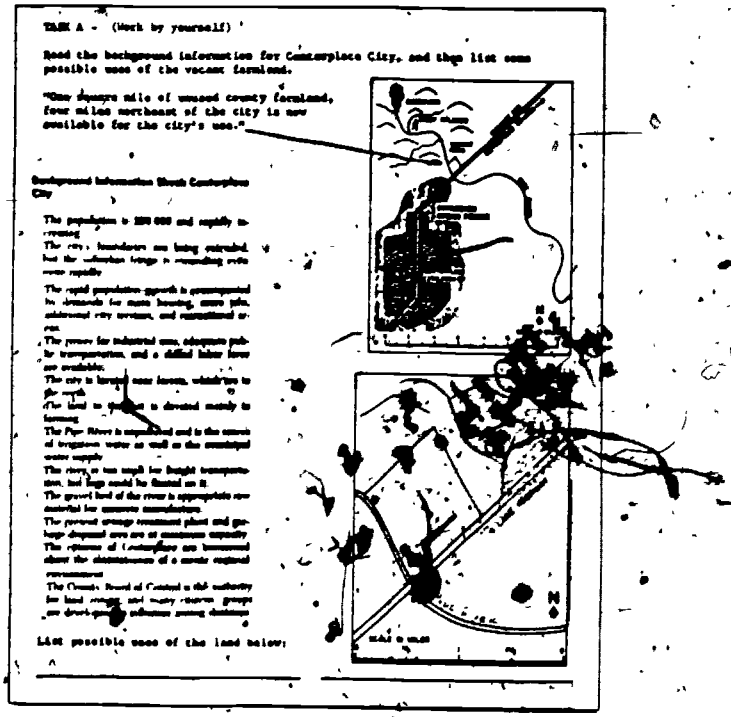
a lesson plan for:

A LAND USE SIMULATION

Set the stage for this investigation by reviewing quickly what will take place. For example: "During this activity we will participate in a simulation game concerning land use in a hypothetical community, analyze what we have done and discuss some ideas and ways for you to develop your own simulation game about local environmental issues or concerns." The techniques used in simulation games combine elements of simulations, games, and role-playing. Participants assume the roles of decision-makers in a simulated environment and compete for certain objectives according to specified procedures and rules.

I. NAMING, RECORDING AND CLASSIFYING POSSIBLE USES OF LAND

1. Distribute TASK A. Read the problem to the group and then have them read the given information on TASK A and list possible uses of the land to meet the cities needs.
2. The problem is to identify some possible uses for the one-square mile (640 acres) of county farmland, four miles northeast of the city. It is now available for the city's use.



TASK A - (Work by yourself)

Read the background information for Centerplace City, and then list some possible uses of the vacant farmland.

"One square mile of unused county farmland, four miles northeast of the city is now available for the city's use."

Background Information About Centerplace City

List possible uses of the land below:

Questions and discussion.

Discussion Skills

Accepting
Supporting
Encouraging
Time to think
Clarifying

Note: When most people have started to write down uses on Task A, go ahead with question No. 1.

1. Ask "What are some possible uses for the undeveloped land?" As people respond, write all comments just as they are said. Don't paraphrase them if they are too wordy, ask: "How shall I write that on the chart?" List all suggestions, specific or general. Number the items as you go along—to simplify identification later. When you feel that you have enough material, go on to question No. 2.

2. Ask "Which of these possible uses are similar?" Designate similar uses by letters, symbols, or colors. When most are designated, or the group seems to run out of thoughts, STOP. Change items among categories if the participants change their minds. Don't get bogged down in the details of grouping. For example if some people think one use should be in another category, then put that use in both categories and go on to the next step.

3. Ask "What label could we give to all the items in the same category?" e.g. Recreation, Industrial, Utilities, Housing, Commercial.

II. DEVELOPING AND GIVING PRESENTATIONS

1. Have the group count off into the number of land use categories. Groups should not be more than 8 persons. Assign one of the categories to each group for them to represent.

   One way to set up groups is to have the total group count off by the number of categories identified.

2. Pass out TASK B and inform the participants they have 10 minutes to list and analyze the advantages and disadvantages of possible uses for the vacant land in the assigned category. They may consider those listed on the board plus any other possible uses they can think of in their category. It is important to stress that this task is to just analyze the uses of the land.

TASK B: Group _____ Assigned Category of Land Use _____

Your task is only to analyze and list possible consequences of different land uses within your assigned land use category, not to decide which is the best use.

Use	Advantages to land/people	Disadvantages to land/people

3. Tell the groups that their next task is to develop a land use plan for the area in their assigned land use category (about 20 minutes)

   NOTE: see 4b for additional direction after each group has started their planning. If all the directions are given at first, many groups start drawing a map before considering different land uses.

4. 5 minutes into their planning make the following two announcements.

a. "We have just received word that due to the current workload from reading environmental impact statements the members of the Board of County Commissioners have all resigned. Each group has one minute to elect one member to represent them on the Board."

b. Have one staff person take the new Board to another room and pass out TASK C. Review TASK C with them.

(1) Have them concentrate on evaluation criteria first
(2) Have chairman read and stick to the announcements at bottom of TASK C - in order to keep the process moving.

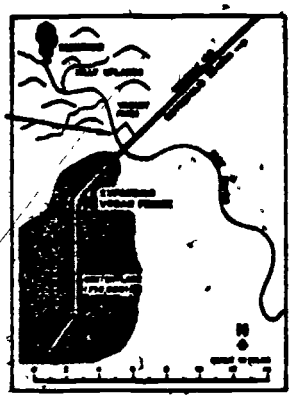
TASK C - County Board members only. Your task is to:

1. Using the information given below: (Take about 10 minutes)
   a. Develop criteria to evaluate the proposals.
   b. Develop a system to record and evaluate your assessment of each presentation.

PROBLEM: "One square mile of unused country farmland, four miles northeast of the city is now available for the city's use."

Background Information About Centerplace City

The population is 250,000 and rapidly increasing.
The city's boundaries are being extended, but the suburban fringe is extending even more rapidly.
The rapid population growth is accompanied by demands for more housing, more jobs, additional city services, and recreational areas.
The power for industrial uses, adequate public transportation, and a skilled labor force are available.
The city is located near forests, which are to the north.
The land to the east is devoted mainly to farming.
The Pipe River is unpolluted and is the source of irrigation water as well as the municipal water supply.
The river is too small for freight transportation, but logs could be floated on it.
The gravel bed of the river is appropriate raw material for concrete manufacturers.
The present sewage treatment plant and garbage disposal area are at maximum capacity.
The citizens of Centerplace are concerned about the maintenance of a certain natural environment.
The County Board of Control is the authority for land zoning, and many citizens' groups are developing to influence zoning decisions.



Group making presentation (use category)	Criteria to assess presentation					
	1	2	3	4	5	6
	Rating					

2. Elect a chairperson to preside during the group presentations and to run the meeting in an orderly manner. (5 minutes)

Announcement to be made by chairperson:
- Because of time constraints there will be no rebuttal after presentations.
- The Board may ask 2-3 clarifying questions of each group after all the presentations.
- You have 3 minutes to give your presentation. You will be given a warning when you have 1 minute left, by our time.

c. Make this announcement after Board leaves the room—You may have to give extra time for everyone to finish.

"You have about 15 minutes to finish your plan and develop a 3 minute presentation to be made to the County Board of Commissioners. Your 3 minute presentation must include a visual display such as a land use map as a part of your presentation and more than one person in each group must participate in making the presentation." (Pass out felt pens and large paper.)

5. When all groups are ready have the County Board enter room and sit at the front. Appoint a time-keeper to cut off all presentations at 3 minutes (give 1-minute warning). Have chairman make announcements listed on Task C.

6. When 5 is finished, the Board retires for 5 to 10 minutes to select the best proposal.

7. While the Board is meeting, each small group develops a list of criteria which they think should be used in choosing between the plans submitted. (Pass out TASK C to use in developing the criteria.)

8. County Board re-enters the room and reads their criteria aloud.

9. County Board announces their decision and gives their reasons. Board adjourns.

   Note: Person in charge must move rapidly to the next question to avoid shouting matches between losing groups. Have Board members return to the groups who selected them. The main purpose is to evaluate the process, not to get bogged down in the content of the issue.

Questions and discussion:

Accepting
Supporting
Encouraging
Time to think

1. What additional data would you like to have had for planning your group's proposal?

   List on board, e.g.: Topography, vegetation, economy of area, railroad, shopping center, adjacent land, climate, soil survey, historical information, flood plain, wildlife, interest of board of control, money available, educational needs, regulations by State, existing zoning, political climate, population information (age needs, race, jobs).

2. Where would you go to collect information on these topics?

3. Point out to the group that this is one of the most important parts of the activity because it emphasizes that we need a variety of information and data before we can intelligently make a land management or environmental decision to best meet the needs of people and their environment. This list has many of the elements that need to be considered in studying a local environmental issue or concern. It also includes elements of all the curriculum subject areas (social studies, science, language, arts, etc.). Therefore we have to use the total community as a classroom or learning environment to collect the information.

4. Discuss any case histories of teachers or groups using this approach.

Optional if there is time, and it is pertinent to the situation, you may want to ask the following questions:

5. Did new leadership emerge during this session? What factors enabled this to happen?

6. Did your group work as a team? What did your group do to insure participation by all members of the group?

7. Were you assigned to a group or interest you didn't want to represent? How did you feel? Point out that many times we overlook that other people have different needs and ideas and this might be a way to identify them.

III. ANALYZING CHARACTERISTICS OF SIMULATIONS

1. "One group of people working with simulation games has identified at least three basic characteristics of most simulation games."

   a. That there is a clearly defined problem. What was the problem in our game?

   b. There are factors that influence the decision. What are some of the factors that influenced the decision?

   c. There are individuals and groups interested in the decision. What were some that we identified?

IV. DEVELOPING YOUR OWN SIMULATION GAME

1. "The most exciting simulation games are ones people develop themselves, based on local environmental issues in their community, state or region."

2. Can you think of some current environmental issues in your own community around which you could develop a game? Call for responses.

3. For the next 30 minutes, work with one or two other people, developing the format for a simulation game based on a local land use issue or topic of your choice. (Have copies of current newspaper articles available if participants want to use them.) "At the end of that time, we would like to hear from several of you about what you have developed."
   Pass out TASK D.

TASK D

DEVELOPING A SIMULATION GAME

Work with 1 or 2 other people.

Using a newspaper article about a local environmental land use problem, develop the format of a simulation game, considering the following items:

- Identify the problem or issue to be decided upon.
- Identify some factors having an influence on the decision.
- Identify individual or group roles. (Those people or groups that will be effected by or interested in the problem.)

Other things you may want to consider in developing simulation games.

- Establish conditions for the players (noting procedures, available resources, money, etc?)
- Develop specific goals or objectives for players.
- Include limits, or rules for what is permissable behavior (the factors, trading, point system, money allocations, etc.)

V. SUMMARY QUESTIONS

Lifting
Time to think
Summarizing

1. Discuss TASK D
2. How can you use the techniques in this session in your job situation? classroom?
3. How could a game like this develop decision-making skills in environmental management?
4. How can we take this process and use it to involve the public in social and political decision-making action projects in the community?
5. How can we summarize the use of simulation games in environmental interactions?
6. Simulation games then can help people understanding about problems in the environment, develop awareness and concern about those problems and skills needed for citizen action and involvement in environmental management.
7. You may want the participants to evaluate the session by writing how they felt about it.

VI. SOME OBJECTIVES

Behavioral Outcomes in Knowledge

As a result of this session each participant should be able to:

Identify and describe three component parts of simulation games.

Construct their own simulation game based on a current environmental issue.

Name and describe at least 10 important types of data needed before making a land management decision.

Identify cause and effect relationships that exist in environmental management.

Describe alternative solutions to solving a specific problem.

Behavioral Outcomes in Feelings, Awareness, Values, and Action

As a result of this session each participant should be able to:

Describe how the information in #3 above could affect their life, community, and the management of the environment.

Outline a plan of action to develop their own land use simulation model.

VII. EQUIPMENT NEEDED

Blackboard or easel
Chalk or magic markers
Newsprint or butcher paper (enough for each group to make visual display)
Magic markers (four colors for each group to make visual display)
Masking tape
Task cards
Commercial games on display (optional)

This lesson plan was developed for use in teacher workshops in February 1971 and revised in 1973, 1974 and 1975. Those people who developed and revised this plan include Charline and Ernie McDonald, Portland, Oregon; Verne Fridley, Ogden, Utah; Pam Fraser, Albuquerque, New Mexico; Al Polcher, Madison, Wisconsin.

The Centerplace City problem has been adapted with permission from the May 1970 Journal of Geography from the article "A Land Use Alternatives Model for Upper Elementary Environmental Education" by Dennis Asmussen and Richard Cole, University of Washington.

The tasks and discussion topics in this lesson are designed so that many can be done individually or in combination depending upon the facilitators objectives and time constraints.

*The discussion skills listed are examples of those necessary to carry out the lesson. Additional information on discussion skills are in the Lesson Plan for Developing Environmental Investigations in this series.

It is suggested by the writers that continuous revision take place by people who use this plan.

SAMPLES OF LAND MANAGEMENT SIMULATION GAMES

The enclosed Simulation Game material includes examples of the hypothetical and real land management problems.

They all use a variety of small and large group problem solving situations, and are designed to help people:

1. Identifying cause and effect relationships that exist in environmental management
2. Generating alternative solutions to solving specific problems
3. Making decisions, based upon the needs of people and the environment, about a particular management issue or concern

See "A Lesson Plan for A Land Use Simulation" for more information about Simulation Games.

The lesson plan for a land use simulation is for the hypothetical problem about Centerplace City. This game takes about three hours to play and can set the stage for a study of a real land management problem.

Notice that the lesson plan includes time to identify a land management problem in a local newspaper and then develop your own simulation game about it. (See lab. sheet "Developing a Simulation Game.")

Other simulations include:

7. Management Plans for Suttle Lake. Written by Jim Durden, U.S.F.S. Teachers at a workshop developed recommendations for management of area and presented to U. S. Forest Service. 35

8. Metolius River Recreation Complex. Written by Jim Durden, U.S.F.S. Used at teachers workshop. Through land inspection, survey interviews with user groups, etc., teachers came up with land management recommendations. 39

Each of the above games utilize the role-playing process as a means to get more effective input by participants. In games such as the Cispus River Area Land Management problem the purpose is to make the best possible input into developing management guidelines and plans.

There are many commercial environmental simulation games that are similar to Monopoly, etc. Some of these include:

Dirty Water	$10.00		
Smog	$10.00		
Ecology	$10.00		
Population	$10.00	Urban Systems 1033 Massachusetts Ave. Cambridge, Mass. 02138	$10.00 each
Pollution	$12.00		
The Redwood Controversy	$10.00		
The Planet Mgt. Game	$16.00	Houghton, Mifflin Co. 110 Fremont Street Dept. M Boston, Mass. 02107	

New Town $16.00 for 10 student kit
Harwell Assoc.
Box 95
Convent Station
New Jersey 07961

Make Your Own Environment--Coca Cola
(Free to School Instructional Media Centers)

GUIDELINES FOR DEVELOPING YOUR OWN SIMULATION GAMES

I. Develop a set of procedures to be followed in playing the game.

- A. Goals and/or objectives
- B. Rules for playing the game
  1. voting procedures
  2. process for recording data
  3. time limits
  4. procedures for presenting data
- C. Responsibilities of the players
- D. Provisions for students to collect data, where obtainable, how best to obtain data.

II. Select a particular land area in your community (examples below)

- A. A vacant lot
- B. An older building - possibly condemned
- C. A small park

III. Establish a land use problem involving the selected area. (example below)

- A. An apartment building is being proposed for a large vacant lot that is used for a sand lot ball field.
- B. A service station is being proposed on a corner across the street from your school.
- C. A low cost housing area is being proposed on some land next to some more expensive homes.
- D. A small shopping area is proposed next to a residential area.

* The land use problem might be developed from a newspaper article from your local newspaper.

IV. Establish the groups which will have a vested interest in the development of the selected land area.

- A. Residents who own homes near the property, planning commission, apartment building owners, construction workers, store owners near the area, children who play on the lot.
- B. Oil company representative, residents, construction workers, parents of school children, school official, city planning commission.
- C. Residents from the more expensive homes, construction workers, contractor, prospective residents of low cost housing, church groups, planning commission.
- D. Residents, store owners, contractor, land developer, city planning commission.

V. Identify the possible effect this change will have on the community.

- A. What effect on taxes for this land and surrounding land.
- B. What effect on land values of the area.
- C. What effect on traffic density and pattern.
- D. What effect on population density and make up.
- E. What effect on schools, playgrounds, churches, stores of the area.
- F. What effect on wildlife, and other natural environment land, water, air.
- G. What effect on utilities - such as garbage, sewage, electricity.

Guidelines for developing your game and a hypothetical simulation game written by Nelson Smith and Henry Gilmore, a Milwaukie, Oregon school teacher.

VI. Some possible ways of developing the game

A. Teacher developed - teacher plans and develops the entire game with objectives, information sheets, maps, role identification and information, playing pieces, cards for information and to present the guidelines and rules.

B. Teachers and students develop the game with students helping to identify the problem, establishing the vested interest groups, finding out cause and effect, costs, and change. (Suggest using a prepared game or two before trying this procedure.)

C. Teacher prepares some task cards to present a situation with some information and the group would develop the rest of the game from the task card. The task card should be clear and concise, but furnish only the general information. The students would develop the specific details.

Agencies which might be consulted for further information:

Milwaukie City Council - May Don Graf 659-5171
Milwaukie Planning Commission - Ch. Don Graf 659-5171
Clackamas County Planning Commission - Ch. Dwain Sherwood 655-3311
North Clackamas Chamber of Commerce
Clackamas County Tax Assessor

Other resource people according to your area

1. local realtor
2. local businessman
3. apartment house owner
4. contractor
5. resident

SUPERHIGHWAY - A SIMULATION GAME

Object - To plot out a new super-highway from Metropolitan area x to Metropolitan area y on the map considering economic and ecological factors.

Materials - Large map of area or transparency, individual maps, role cards, work sheets.

Procedure - Introduce the large map stating that this is a hypothetical problem which we have to solve. Indicate on the map the various areas of land use - Farm, ranch, timber, marsh, hill, mts., village and city. The teacher can make a decision on the amount of discussion netessary prior to beginning game. Some of the following factors might be discussed with the class as a whole to help prepare them to make some decisions.

a. Propose various routes and discuss possible affects.
   1. If the route was to pass through or near the city; how might affect that area.
   2. If the highway was routed south of the nountains, what affect would it bring about to the city, village and lands it passes through.

b. What might be the cost of the various routes (this factor is built into the game as stated later).

c. Time between cities x and y will be shorter - areas outside these cities could be developed because of less time to drive to work areas. How might this change land use areas?

After general discussion, the students should be given a role to act out in making their decision on route to be chosen. Each role is on a card with some information as to the role and some of the effect that might occur. Each student should be clear as to the role he has assumed and the teacher should check to make sure role is clear to the student.

The roles are as follows:

Farmer A, B and C - Representative of the farmers for each of the three areas on the map. They are concerned with their immediate problems.--should he highway pass or not pass through their land.

Rancher A and B - Rep. of ranches of the two areas on the map.

Timber owners A and B - Rep. of timber owners of the two areas on the map.

City Business men - Rep. of the business interests of the city.

City Residents - Rep. of the residents interests of the city.

Village Businessmen - Rep. of the business interests of the village.

Village residents - Rep. of the residents of the village,

U.S. Forest Service - Rep. of the U.S.FS. - Concerned with area in mountains, hills and marshlands.

Fish and Game Bureau - Rep. for fish and game protection - concerned with area in mountains, hills, marsh lake and rivers.

Sportsman - Rep. for hunters and fishermen.

Environmental Protection Groups - Three rep. who are interested in protection of the environment

County Planning Commission - Decision making body of 3 to 5 students who make the final decision on which route to select on the basis of the presentation by the rep. of the various interest groups.

The roles may be assumed by individual students or in pairs of students as found appropriate to class size.

To facilitate decision making each of the interest groups have been assigned to a committee to develop a plan which will be presented to the County Planning Commission. The committees are made up of the following representatives:

Committee I

Farmer A, City Businessman, City Residents, Timber Owner B and one Environmental Protection Representative.

Committee II

Rancher A, Fish and Game, Sportsman, Timber Owner A, U.S. Forest Service and one Environmental Protection representative.

Committee III

Farmer B, Farmer C, Village Businessman, Village Resident and one Environmental Protection representative.

Once the students have their roles and have established their committees, a spokesman should be selected for each committee to present their proposal to the County Planning Commission.

Each student should be given a map and a work sheet in order that they can individually develop a route that would be most advantageous to their interest. Then in a committee they will discuss and determine the best route that would satisfy the interest of their committee members. This should result only after considerable discussion, bargaining and compromising.

When a route has been selected by the committee, they should prepare their proposal for presentation to the County Planning Commission.

The work sheet is used by the student to determine the economics of purchasing and construction of the highway.

To determine the cost of purchasing land to build the highway, a number between 1 and 4 has been used.

1. = low cost
2. = moderate cost
3. = high cost
4. = extremely high cost

On the work sheet these numbers are found in the first column. To determine the cost of constructing the highway through the various areas, a number of 1, 2 or 3 has been used.

1. = low cost
2. = moderate cost
3 = high cost

On the work sheet they are found in the second column.

To determine the cost of developing the highway, the student will count the number of squares that his intended route will cross in each area. For example, the use of the score sheet would be as follows: If the route passed through 12 squares of ranch land, 3 squares of mountains, 4 of hills, 0 of ranch, 0 of river, 4 of timber, 9 of farm, 1 village and 0 of city.

Type of Land	Purchasing Cost	x	Cost of Development	x	Number of Squares	=	Total Cost
Ranch	1	x	1	x	12	=	12
Mountains	1	x	3	x	3	=	9
Hills	1	x	2	x	4	=	8
Marsh	1	x	3	x	0	=	0
River	1	x	3	x	0	=	0
Timber	2	x	2	x	4	=	16
Farm	3	x	1	x	9	=	27
Village	4	x	2	x	1	=	8
City	4	x	2	x	0	=	0

Grand Total is sum of all totals 80

Consider area of the square crossed to that which covers the largest portion of the square - ex.  since ranch takes the greatest portion it should be counted as a ranch square.

The grand total would be the economic factor presented by the individual or committee proposal. Additional factors should be considered for the proposal. Space has been given on the work sheet to write out advantages and disadvantages of the route and finally a summary taking into consideration all the factors that should be presented to the planning commission. Particularly emphasis should be placed upon considering environmental factors affected by their proposal.

The students selected for the County Planning Commission have a very important role to play. They are responsible for th eventual decision of which route to use and why. While the committees are in session, it will be the responsibility of the County Planning Commission to set up a set of criteria for making a decision upon choosing the most desirable route.

The use of this game is quite flexible. Theinvolvement of the teacher into assisting in decision making is up to the individual teacher. The maps can be colored to help identify the various areas. They can copy the color code of the master transparency or can be colored by the individual and their own key developed.

Other suggestions for use of this game would be to use the same materials for locating and industrial park, a railway or any other project feasible for development.

Rancher A and B

These players represent all of the ranchers from the ranch lands A and B. The rancher from either area might have some of the following interests in the development of the highway:

(1) How will this affect his use of the land.
(2) What affect will the highway have on his marketing his cattle?
(3) What types of future development might occur which would affect the rancher?
(4) What affect will the highway development have on the natural environment.

Farmer (A,B, and C)

This player represents the farmers for area A, B or C (need 3 cards). The farmer might have some of the following interests in the development of the product.

(1) How will the highway development affect his land value.
(2) How will the highway development affect his market for his farm products.
(3) What types of future development might occur which would affect his farm products.
(4) How will the highway's development affect the farmer's taxes?

City Businessman

This player represents the businessman of the city. The businessmen might have some of the following interests in the highway development.

(1) What new business might be developed as a result of the highway?
(2) How might the highway affect the availability of goods in the city?
(3) How might the highway affect the population of the city?
(4) Will the highway cause any change in goods which might affect prices?

City Resident

This player represents the resident of the city. The resident might have some of the following interests in the highway development.

(1) What affect will the highway development have on land values?
(2) What affect will the highway development have on population growth?
(3) What affect will the highway development have on taxes?
(4) What affect will the highway development have on the appearance of the cit
(5) What affect will the highway development have on environmental quality (air, sight, noise pollution)?

Village Businessman

This player represents the businessmen of the village. The businessmen of the village might have the following interests in the highway development.

(1) What affect will the highway have on availability of goods?
(2) What new businesses might be possible as a result of the highway development?
(3) How will the highway development affect the population of the village?
(4) Will there be a change of goods which will affect prices?

Village Resident

This player represents the residents of the village. The village resident might have some of the following interests in the highway development:

(1) What affect will the highway have on land values?
(2) What land will change in use and what affect will that have on the village?
(3) Will the highway development have any affect on taxes?
(4) What affect will the highway development have on environmental quality (air, noise, pollution)?

Timber Owner

This player represents the owner of timberland A or B. The timberland owner might have the following interests in the development of the highway:

(1) What affect will the highway development have on the environmental quality (air, water, noise, sight pollution)?

(2) What affect will the highway development have on population of the area?
(3) What affect will the highway have on the use of the forest?

Environmental Protection Society

This player represents the agency of the government which has the responsibility for the welfare of the fish and game. This bureau might have some of the following interests in development of the highway.

(1) What affect will the highway development have on the water?
(2) Will this highway change the use demand of the lakes, rivers and game areas?
(3) What future development or land uses might occur as a result of the highway development?

Sportsman

This player represents the sportsmen. The sportsman might have some of the following interests in the highway development.

(1) What affect will the highway development have on the number of persons using this land?
(2) What affect will the highway development have on habitat for wildlife?
(3) What affect will the highway development have on the natural envirbnment?
(4) What future developments might occur as a result of the highway development?

County Planning Commission (3-5 members)

These players represent the decision-making body which will evaluate the proposed routes. This group will not develop its own route but rather must develop a set of criteria for evaluating the routes proposed by the committees. (These are examples and not complete -- the commission should expand these).

(1) What affect will each route haveon the natural environment?
(2) Which route will have the most favorable costs?
(3) Which route will benefit the greatest number of people?
(4) What affect will each route have on possible future development?

The commission might develop a worksheet for rating each proposal so they can compare them.

Forest Service

This play represents the Forest Service Agency. The Forest Service might have some of the following interests in the development of the highway.

(1) What affect will the highway development have on the enyironmental quality (air, water, noise, sight pollution)?

(2) What affect will the highway development have on population of the area?

(3) What affect will the highway have on the use of the forest?

Fish and Game Bureau

The player represents the agency of the government which has the responsibility for the welfare of the fish and game. This bureau might have some of the following interests in the development of the highway.

(1) What affect will the highway development have on the [redacted]

(2) Will this highway change the use demand of the lakes, rivers, and game areas?

(3) What future development or land uses might occur as a result of the highway development?

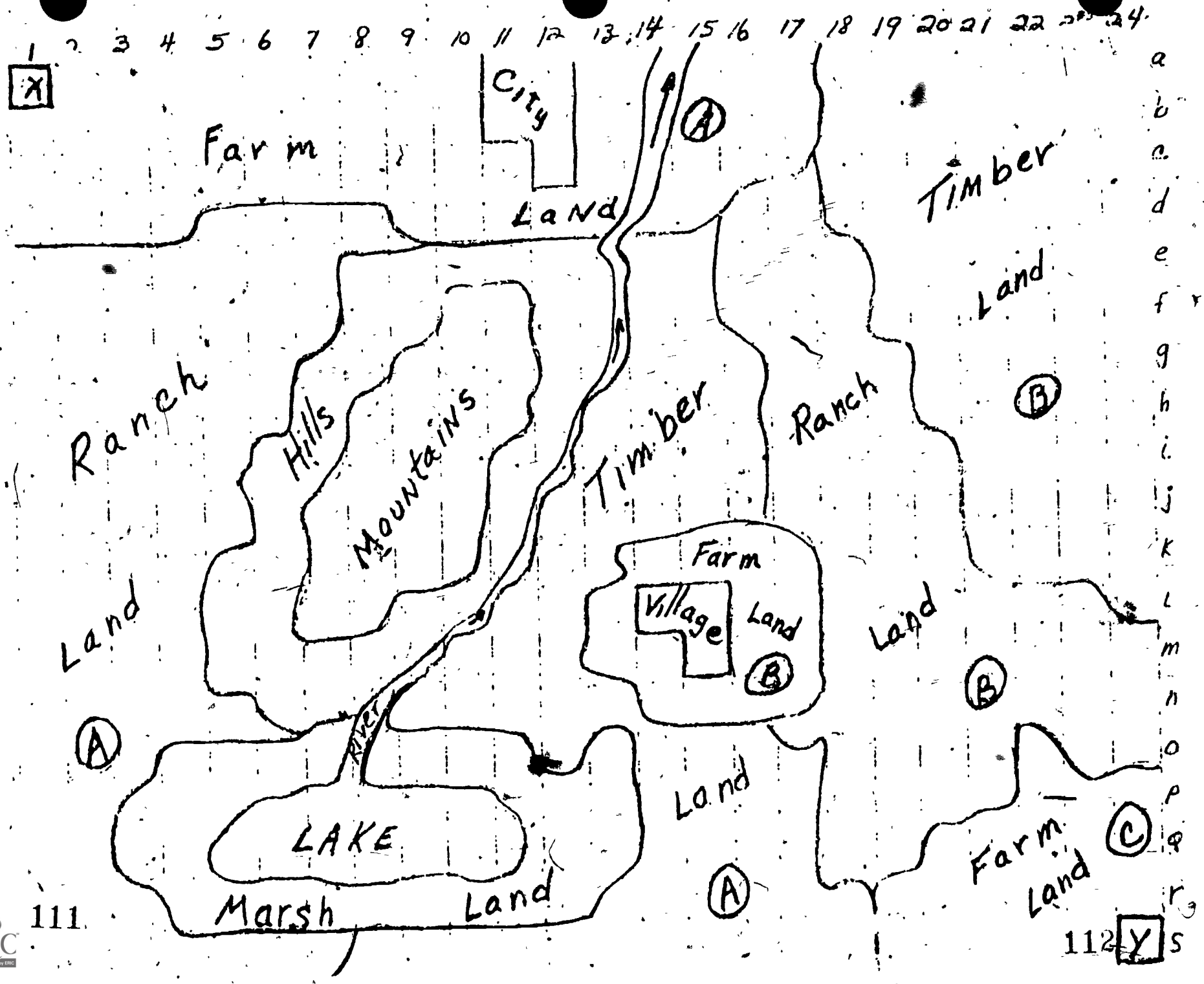
Work Sheet

Types of Land	Purchasing Cost	X	Development Cost	X	Number of Squares crossed		Total Cost
Ranch	- 1	X	1	X		=	
Mountains	- 1	X	3	X		=	
Hills	- 1	X	2	X		=	
Marsh	- 1	X	3	X		=	
River	- 1	X	3	X		=	
Timber	- 2	X	2	X		=	
Farm	- 3	X	1	X		=	
Village	- 4	X	2	X		=	
City	- 4	X	2	X		=	

*Grand Total = _____

List advantages and disadvantages of your route below.

Reason for selection of route (consider ecology, cost, effect on future of the area), etc.


1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
a b c d e f g h i j k l m n o p q r s
X
Y
City
Farm
Land
Timber
Land
Ranch
Hills
Mountains
Timber
Ranch
Land
Land
Farm
Village
Land
Land
River
LAKE
Marsh
Land
Land
Farm
Land
A
A
A
B
B
B
C
111
112
13

SIMULATION GAME

I. The Area

Centerville, Oregon is a hypothetical community of 600,000 people with an expanding population of about 10% per year. Because of the increase in size based on an expanding industrial complex, there is need for additional housing and schools. Most of the people represent the typical suburbanite working a 40 hour week, with an adequate income for the necessities of life, plus "fun" money and time for recreation.

The industrial base is geared to timber and moderately heavy industries, such as, aluminum production that require substantial electric power.

There is a 3,000 acre low elevation "mini"-wilderness about 20 miles from town that has not been developed in any manner. It supports a vigorous growth of Douglas fir on about 2,000 acres yielding a growth rate of 60,000 to 80,000 board feet of timber per acre per year, based on a 100 year rotation cycle. This is enough timber to provide the lumber to build 1200 to 1600 houses annually for the community or for lumber export to other parts of the State or United States. There are also heavy coal deposits near the surface that could produce millions of tons.

The other 1,000 acres contain meadows that produce excellent forage for the grazing of domestic livestock, i.e., sheep or cattle. The foothills also are high site soils capable of producing an abundance of agricultural crops.

There is a source of clean pure water coming from the "wilderness" to provide for the domestic and industrial needs of the community, although in the summer, there appears to be a water shortage imminent, because there are no reservoirs. The water also supports an excellent run of anadromous fish (salmon, steelhead, and sea-run cutthroat trout) plus a resident population of native trout.

During the winter, the higher elevation of the wilderness area also has from 2 to 3 feet of snow for about 4 months per year.

II. The Problem -- Conflicting Uses

1. Loggers. They want to clearcut harvest the timber to help maintain a healthy economic base. This of course would necessitate an adequate road system.

2. Agriculturalists. They want to use the foothill lands for raising crops and the high country meadows for grazing sheep and cattle during the spring and summer months.

*Written by Tom Harlan, U.S.F.S. Used at a teachers workshop in Lincoln City, Oregon, based on the Centerplace model.

II. The Problem -- Conflicting Uses (cont.)

3. Mining and heavy industrial - They want to strip mine the coal from the entire area to provide resources for the aluminum company and other fossil fuel industries, and build a hydroelectric power plant.

4. The local water board - They want the area to be locked up and kept from any form of public entry to maintain water purity and sanitary conditions.

5. Subdivision home builders - They want to use the area to build homes for the increasing population, to provide new schools for children, shopping centers, etc. in the lowlands, and summer home sites around the lakes and streams.

6. Wilderness "buffs" - They want the land left as it is with the exception of a trail system to reach the lakes. There would be no allowance for any mechanized form of travel i.e., no motorcycles, cars, motorboats, and no use of any mechanical devices such as chain saws for trail maintenance or fire wood gathering. During the winter this group would also use the area for cross country skiing.

7. Fishermen and hunters - They want to develop a road system, but are concerned that streams will be ruined if much or any logging or coal mining is done, and are against reservoirs because of the impact on the fisheries resource.

8. All Terrain Vehicle owners - They want a road system, but don't want any resources taken from the land because it would interfere with the use of motorcycles, "Ski-doos", "Terra-Tigers", and other such cross country motorized vehicles.

III. Solutions

The class will be divided into groups, each representing one of the special interest groups 1 through 8. Each group will have _____ minutes to come up with arguments to convince a County Board of Commissioners why the land should be used for the purpose they represent. When the time is up they will have _____ minutes to state their case to the board.

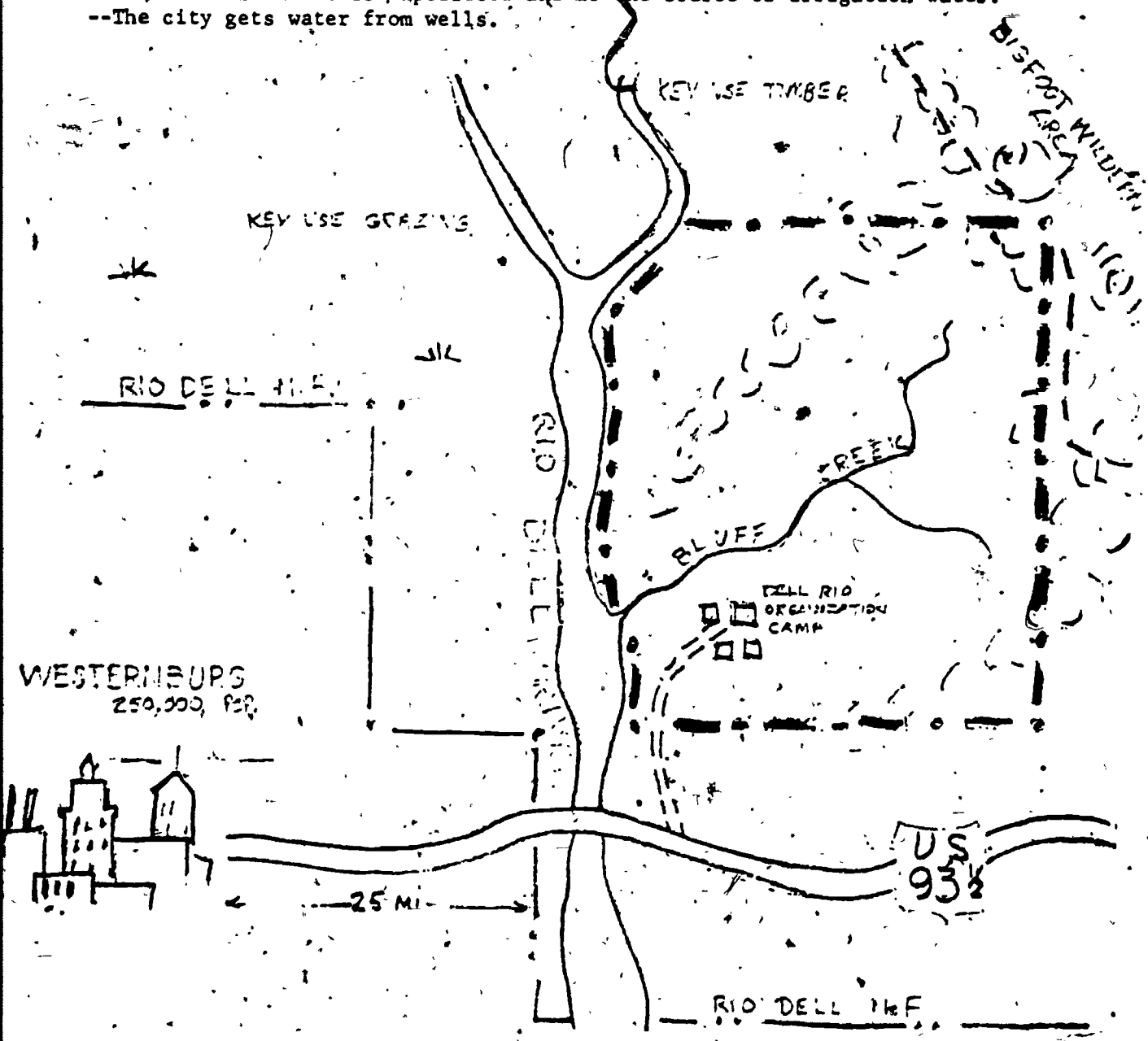
After the presentations, the Board will recess for _____ minutes and come up with their conclusion on land use. (tabling the issue for a future meeting is not allowed)

TOM HARLAN
U.S.F.S.

RIO DELL LAND USE PROBLEM

Background Information Sheet:

--The population is 250,000 and rapidly increasing.
--The city's boundaries are being extended, but the suburban fringe is expanding even more rapidly.
--The rapid population growth is accompanied by demands for more housing, more jobs, additional city services, and recreational areas.
--The power for industrial uses, adequate public transportation, and a skilled labor force are available.
--The city is located near forests, which are to the north and east.
--The land to the south is devoted mainly to farming.
--The Rio Dell River is unpolluted and is the source of irrigation water.
--The city gets water from wells.



THE PROBLEM

A 6,000-acre piece of State land has been acquired by the Forest Service through land exchange. The problem is to resolve proposed land use conflicts to meet the needs of the local people and the characteristics of the land.

itten by National Training Team for Environmental Education, U.S.F.S. A eoretical problem based on the Centerplace game.

RIO DELL LAND USE PROBLEM

Westernburg Preservation Council

--4,000 member council including key community leaders.
--Area was included in original study of the Bigfort Wilderness Area, but was excluded because of the state's commitment for timber production to industry.
--Area includes outstanding examples of virgin yellow pine and India pictographs are in the lower canyon walls of Bluff Creek.
--Proposed city dam will cover pictographs.

Westernburg City Council

--250,000 people in community.
--Need adequate dependable municipal water supply. The water table has dropped 10 feet in past 5 years due to population and industrial increase.
--IBM Company will establish electronics plant for 500 workers if city can guarantee water.
--Land lends itself to a proposed dam on the lower part of Bluff Creek.

Ames County Trail Machine - 4-Wheel Drive Club

--5,000 motor bikes in county.
--10 motor bike dealers.
--2,000 motor bike owners are in organized clubs who have helped the Forest Service in search and rescue and in opening roads and trails. These people are concerned with their image and enforcement of bike uses for all.

Westernburg Urban League

--Has history of organizational site use on Bluff Creek, under lease from State, for disadvantaged kids of Westernburg.
--Have $100,000 invested in camp.
--Want to expand to better meet the needs of all disadvantaged kids in Core area.
--Provide forest outdoor experience for 10,000 kids a year.

Mercham Timber Company

--Timber volume of acquired land is 100 MM of virgin P.P.
--State had assured industry that the area would be used for timber production.
--Local mill capacity is double the National Forest allowable cut.
--National Forest allowable cut is 70 MM.
--Private lands are fairly well cut-over and National Forest is being pressured to contribute maximum timber yield.

RED RIVER FREEWAY

The Red River High School has been asked by local and state conservation groups to participate in the fight against construction of a new highway that has been planned to pass near the town of Red River. The highway will provide access to a vast new recreation area that previously had been accessible only by horseback or backpacking and in some instances 4-wheel drive vehicles. Recently, some of the area had been designated as a new National Park which is bordered by National Forest Land inter-mixed with private land ownership.

The town of Red River is located in a broad, fertile river valley near the foothills of the mountains. Most of the local income is derived from prosperous farms and ranches except for a construction company that has its main office there. Pre-capita income is high and can be expected to rise slightly. The river is relatively pollution free providing the town with its domestic water supply and also extensive irrigation for the farms. There is a good trout fishery in the stream which brings a number of tourists into the area each summer. Each fall there is a large influx of big game hunters, Red River being close to large elk and deer herds. All of this adds to the prosperity of the local area.

A power group of construction people supported candidates who won political offices in the state government, who in turn were instrumental in getting the highway to be located where it is. These construction people hope to get a large share of the construction bids, particularly the local company. State and Federal funds have been provided for construction but with little money available for conservation measures and beautification after construction is completed. Highway right-of-way will take large acreages from some of the local ranchers, plus most of the FFA model farm which has been rated as the best in the state and one of the best in the nation.

There is little doubt that Red River will prosper and grow with the flood of tourists the new highway will bring to the area to enjoy the fishing, hunting, new ski areas, hiking and sightseeing.

However, the conservation groups are pushing to introduce a bill in the legislature to stop construction of the highway. They feel that there is no need to provide such easy access to the recreation area. Some studies have shown that much of the area cannot stand concentrated use without causing damage to the ecology. There is also fear that increased hunting and fishing will ruin these valuable resources. The groups efforts to obtain voters signatures to support their bill has been highly successful throughout the state. There has also been support by national conservation groups.

WHAT ARE THE DECISIONS RRHS WILL MAKE???

*Written by Jim Unterwegner, U.S.F.S. Used at High School leadership training sessions at Cispus Environmental Learning Center, Randle, Washington.

COMMUNITY ACTION
Simulation Game

Purpose of all citizens groups involved in the game:

Recommend ways to improve the environmental quality of the community of Stevenson. (economically, culturally, socially, aesthetically)

Community action should:

1. Stop the deterioration of Stevenson by eliminating sources of environmental pollution,

2. Implement positive measures that will enhance the livability of the Stevenson community for the present and future through effective environmental management.

Citizens groups include:

Stevenson Businessmen's Association
Stevenson Industrial Association
Stevenson P.T.A.
Stevenson Garden Club
Stevenson Department of Sanitation

Stevenson Board of Controls (city planning council)

Procedures

Elect a chairman for each group.

Decide how you will plan your investigation.

Decide what statistical data you need to collect, either from written material or from the community itself.

Check the reference material on the library table ; use anything that will help your group accomplish its objectives.

Use Stevenson city maps as you spend time in the community gathering data.

Report back at 2:30 p.m.

Reporting your findings

Each group will have a large piece of paper on which to record their specific recommendations and benefits to the community.

Each group should contribute some parts of their information to the large city map on the wall.

One person from each group should be prepared to make a presentation representing your group's findings. Your specific recommendations will be considered by the Board of Controls for adoption. Your group's goal should be to have your recommendations adopted.

*Written by Charline McDonald. Used at a teachers workshop in Stevenson, Washington, embodies role playing and urban data-collecting..

COMMUNITY ACTION
Simulation Game

Concerns of Stevenson Industrial Association

1. Economic growth in the community assures adequate labor force.
2. Satisfying consumer demands for manufactured products of the Stevenson area.
3. Maximizing profits through continued production and assurance of continued supply of raw materials for production.
4. Encouraging new industry to the Stevenson area that will not contribute to the degradation of the environment.

Suggestions for Community Investigations

1. Inventory existing industries in the Stevenson area.
   Plot on map.
2. List desirable new types of industry.
   List supply area for their raw materials and possible marketing areas.
   Locate possible sites on map.
3. Make specific recommendations to improve the economy of Stevenson.

   List below and be prepared to present your recommendations to the rest of the group.

Recommended Industrial growth	Benefits to Community

COMMUNITY ACTION
Simulation Game

Concerns of Stevenson Businessmen's Association

1. Revitalizing Stevenson's downtown business district through improvement of existing goods and services.

2. Increase patronage in the local business district through additional businesses.

3. Maximizing profits through improvement of total community environment, particularly in downtown business district.

4. Bringing local buying power back to Stevenson; (major metropolitan center 50 miles away)

5. Adequate public utilities (sewage disposal, water, parks) will increase the possibility of new economic investments.

Suggestions for Community Investigations

1. Inventory the central business district of Stevenson. Plot on map.

2. Distinguish between concentrations of goods and services.

   Determine streets of heaviest pedestrian count.
   Determine streets of heaviest traffic flow.

3. Recommend sites for rehabilitation of existing buildings.
   Recommend sites for establishing new businesses.
   Plot on map.

4. Make specific recommendations for revitalization of Stevensons central business district for economic improvement and improved customer services.

   List below and be prepared to present your recommendations to the rest of the group.

Recommended Improvements	Benefits to Community

COMMUNITY ACTION
Simulation Game

Concerns of Stevenson P.T.A.

1. General cleanliness of the environment.
2. Establishment of adequate sewer treatment plant to eliminate health hazards.
3. Adequate park and recreation facilities for children and their families.
4. Develop pride on the part of Stevenson's citizens to clean up their community.
5. Civic responsibility to make Stevenson a quality environment for all.

Suggestions for Community Investigations

1. Inventory existing recreation sites in Stevenson.
   Plot on map.
   List uses of each.
2. List desirable new types of recreational sites and facilities.
   List uses for each.
   Locate possible sites on map.
3. Make specific recommendations to increase the recreational services to the community of Stevenson.
   List below and be prepared to present your recommendations to the rest of the group.

Recreational facilities	Benefits to Community

COMMUNITY ACTION
Simulation Game

Concerns of Stevenson Garden Club

1. Improvement of the aesthetics of the Stevenson community.
2. Beautify streets and city entrances with plantings.
3. Promote community action to take care of vacant, deteriorating buildings in community.
4. City has few parks or recreation sites within easy access from community of Stevenson.
5. City has poor access to creek; poor access to river for boating and other water-oriented recreation.

Suggestions for Community Investigations

1. Inventory the city for its beautification needs.
   Locate these areas on map.
   List types of improvements that should be made.
   List community groups that could accomplish this.
2. Make specific recommendations to increase the aesthetics of the community of Stevenson.

*List below and be prepared to present your recommendations to the rest of the group.

Beautification Projects	Benefits to Community

COMMUNITY ACTION
Simulation Game

Concerns of Stevenson Department of Sanitation

1. Increasing the aesthetics and general cleanliness of the Stevenson environment.

2. Satisfying the environmental health needs of the community.

3. Providing for continuous planning and updating of facilities through community action.

4. Resolving Stevenson's violations of the Federal Water Pollution Control Administration requirements.

5. Arranging for planning and costs of sewage treatment facilities and improved water source facilities.

Suggestions for Community Investigations

1. Inventory the Stevenson community.
   Identify sources of environmental pollution (water, air, and sight pollution).
   Plot on map. List detrimental effects of each.

2. Make specific recommendations for elimination of environmental pollution problems in Stevenson.

Recommended Improvements

Benefits to Community

Reference Data Sheet
for Simulation Game

Here are some additional items for consideration:

Total land in Skamania County: 1,070,270 acres

80% USFS - Gifford Pinchot National Forest
7% Commercial forest land (Dept. of Natural Resources)
13% Non-commercial forest land, and Miscellaneous

County Population: 6,038
Projected for 1979 ------7,948
County growth rate from 1950 to 1969 showed net gain of 28.1%
Projected population growth of county 15.2% per year

Skamania County Total Personal Income Estimates

1950 -- 5.5 million dollars
1960 -- 9.7 million dollars
1968 -- 16.8 million dollars

Water Pollution Control Commission, "Implementation and Enforcement Plan for Interstate and Coastal Waters", June, 1967, states:

"Existing Sewage Treatment - Town of Stevenson ----NONE."

"Required Treatment and Control Improvements for Town of Stevenson:"

"Establish Secondary Sewage Treatment"
"Improve Disinfection Facilities and Outfall Facilities"

TIME SCHEDULE FOR TOWN OF STEVENSON TO COMPLY WITH WATER POLLUTION CONTROL REGULATIONS:

Date	Project
by June, 1967	Completion of Engineering Report for secondary sewage treatment facilitiy
by Sept., 1968	Completion of Construction Plans and Specificatio
by Dec., 1968	Arrangement of Financing, Advertising for Bids, and Start of Construction
by Dec., 1969	Facilities Placed In Operation

Resolution 1-67 - County of Skamania, resolved that it should be unlawful to pollute the river with any raw sewage. Resolution passed Sept. 18, 1967.

Water Supply -- according to Skamania County Sewage and Water Study, both Stevenson and Carson appear to have limited water resources in their immediate vicinity for future water supply.

Present water shortage during summer months will become increasingly severe as Stevenson and the surrounding area grow in population.

AVERAGE MONTHLY PRECIPITATION AND TEMPERATURE

Station & Elev.		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	ANNUAL
Wind Riv. 1150'	P"	16.1	12.5	11.5	6.3	3.7	2.5	1.0	1.1	3.0	8.7	14.7	18.4	99.5"
	T°	32	36	40	47	53	58	64	63	58	49	40	35	48°
Stevenson 319'	P"	9.9	9.7	7.1	3.6	2.6	2.0	.8	.4	3.2	10.6	10.8	10.7	71.4"
	T°	34	38	43	51	56	62	65	66	63	52	45	38	51°
Vancouver 100'	P"	5.6	4.4	4.0	2.3	2.0	1.9	.5	.7	1.6	3.6	5.6	6.7	38.9"
	T°	39	42	47	53	58	63	68	67	64	55	46	42	54°

Make the following comparisons of the data:

Station	Annual Temp	Warmest Month	Coldest Month	Annual Temp Range	Annual Prec.	Driest Month	Wettest Month	Total Rain 6 Winter Mo. (Oct.-Mar.)	Total Rain 6 Summer Mo. (Apr.-Sept.)
Wind River	43°	July 64°	Jan 32°	32°	99.5"	July 1.0"	Dec 18.4"	81.9"	17.6"
Stevenson									
Vancouver									

1. Compare the yearly temperature patterns of the 3 stations. What reasons can you give for this temperature pattern?

2. Which of the 3 stations gets the most annual precipitation? the least? How do you account for this?

3. Notice that Wind River gets more rainfall per month than Stevenson. Which month is the exception? What reasons could account for this?

4. Compare winter rainfall with summer rainfall for each station.

5. In what ways does the amount of summer rainfall affect the community life of Stevenson?

6. In what ways does the amount of summer rainfall affect the use of the land in the Wind River area?

7. Using the data at the top of the page, prepare a line graph for Stevenson and Wind River, showing monthly averages for temperature and precipitation. Use the Climatic Chart provided.

MAP INTERPRETATION QUESTIONS
for Stevenson, Washington

1. Describe the site of Stevenson in as many ways as possible. (Site refers to the location of something in relation to other natural and man-made features)

Man-made features	Natural features

2. For what functional specialty was Stevenson established?

   Has it changed? Why or why not?

3. What are some advantages and disadvantages of Stevenson's location in relationship to its economic growth?

Advantages	Disadvantages

4. From which watershed does Stevenson get its drinking water?

   Locate the boundaries of that watershed on one of the maps.

   Is there enough water available in the Stevenson area for increased population growth?

5. Why is the Skamania County Seat located at Stevenson?

6. Look for evidences of different types of land use on the maps. List some of the land uses.

7. What predictions can you make about future uses of the land in the Stevenson area?

8. What differences do you notice in the uses of the land on both sides of the Columbia River?

9. Describe or sketch the shape of the town of Stevenson.

10. What factors have caused it to be the shape it is?

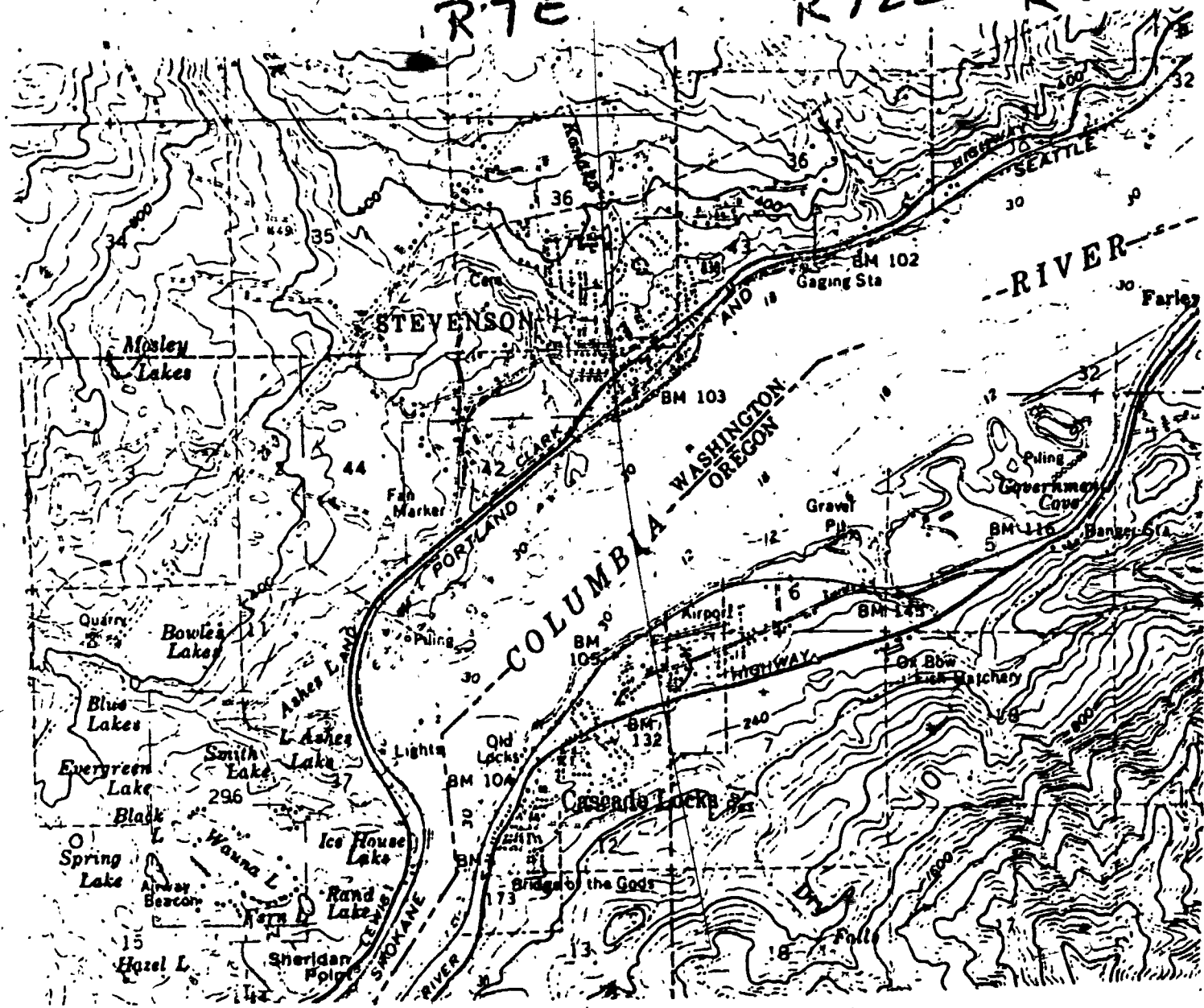
11. Compare the street pattern of Stevenson with that of Carson. What could account for this difference?

12. Complete the Land Users Chart below using the following series of questions for Past, Present, and Future users of the land.

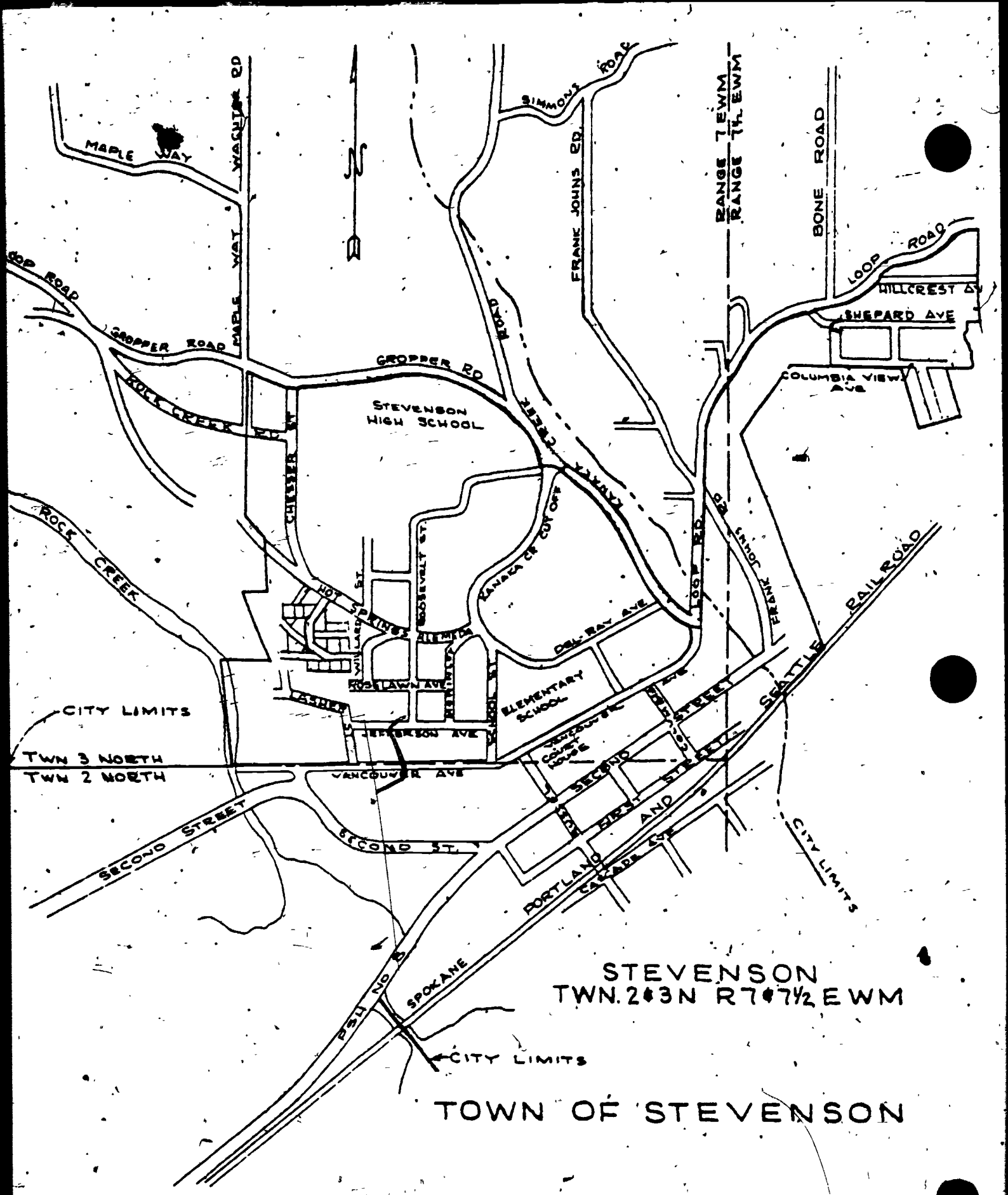
Who were the past (present, future) land users of Stevenson and vicinity?
How did they use the land?
What type of settlement did they make?
How did they affect the environment?
What things did they value in the environment?

SEQUENCE OF LAND USE OF STEVENSON AREA

Land user	How they used the land	Type of settlement	How they affected the environment	Things they value in environment
Past				
Present				
Future				



BONNEVILLE QUAD


MAPLE WAY
WAGNER RD
MAPLE WAY
SIMMONS ROAD
FRANK JOHNS RD.
RANGE 7EWM
RANGE 7½EWM
BONE ROAD
LOOP ROAD
HILLCREST AV
SHEPARD AVE
COLUMBIA VIEW AVE
GOD ROAD
GROPPER ROAD
GROPPER RD
ROCK CREEK
ROCK CREEK
CHESTER ST
STEVENSON HIGH SCHOOL
ROOSEVELT ST
KANAKA CR CUT OFF
HOT SPRINGS
ALEMEDA
DEL RAY AVE
LOOP RD
FRANK JOHNS RD
ROSLAWN AVE
ELEMENTARY SCHOOL
ASHER
JEFFERSON AVE
CITY LIMITS
TWN 3 NORTH
TWN 2 NORTH
VANCOUVER AVE
COURT HOUSE
SECOND
FIRST
STREET
AND
SECOND ST
SECOND STREET
SEATTLE
RAILROAD
CITY LIMITS
CASCADE AVE
PORTLAND
SPOKANE
PSU NO 3
CITY LIMITS
STEVENSON
TWN. 2&3N R7&7½ EWM
TOWN OF STEVENSON

CISPUS RIVER AREA LAND MANAGEMENT PLAN, RANDLE, WASHINGTON

The approximate 20,000 acres outlined in RED on the Randle Ranger District map is in need of having a land management plan developed for it. Resources to be considered in developing the plan include:

SOILS -- basic to all management

PLANTS -- timber management
grazing - cattle, wildlife

WATER -- irrigation, fishing
domestic use, etc.
scenic

RECREATION -- use for humans

****

Some basic data about the area:

Soils & Watershed

-Steep soils in upper slopes - timbered, rock outcroppings, unstable soils, high road building construction & maintenance costs - motor bike erosion on steep trails..
-Flat soils in river bottoms - most productive for timber growth and recreation use.

(Cispus road is main access road in & out of area -- Goes to Trout Lake; Mt. Adams & Goat Rocks Wilderness areas, many other lakes. Last year 75,000 passenger cars and 75,000 logging trucks traveled the road.)

Recreation Management

3 campgrounds in area
20,000 visitor days to the campgrounds - (over use)
1 lake (good fishing)
3 pot holes (good fishing)
20 miles of trail (1 high ridge scenic trail)
Approximately 15 miles of Cispus River
Motor-bike trail problem
Snow-mobile use in winter
Huckleberry picking areas

Timber Management

The timber stands are like those you drove through coming to Cispus from Randle.
Thinning in second growth now under way.
Two timber sales planned for 10 million board feet of old growth timber (See dotted outline of sale on map)
Some young stands planted by C.C.C. after large forest fires in early 1920's.

*Written by Ivar Knutson, U.S.F.S. Used at summer teacher workshop through Central Washington College. Teachers visited area after doing the game and compared actual on-the-ground management with their plan of management.

Wildlife Management

Cispus River is unproductive fish stream.
Hatchery fish are planted in tributaries to Cispus River.
3 small ponds are planted with fingerlinds and legal fish to enhance fishing recreation in area.
Good natural fishing in Blue Lake.
Elk herd winters in bottom lands along river -- some winter kill.
Deer herd in high country along the North side of outlined area on the map.

TASK A

Each resource management group (Recreation, Timber, Soils & Watershed, and Wildlife Management) is to develop a list in writing of 5 management guidelines, for the management of their assigned resource, to be considered in the development of the management plan for that area. (Divide group into 4 subgroups each with responsibility for one resource.)

RECREATION

1. _____
2. _____
3. _____
4. _____
5. _____

TIMBER

1. _____
2. _____
3. _____
4. _____
5. _____

SOILS & WATERSHED

1. _____
2. _____
3. _____
4. _____
5. _____

WILDLIFE MANAGEMENT

1. _____
2. _____
3. _____
4. _____
5. _____

TASK B

Part I (Now have each of the preceeding groups consider themselves as a total resource management planning group responsible for management of all resources on the area.)

Evaluate the guidelines developed for the 4 resource areas and select the ones from each area or combinations of areas that you feel will best meet the needs of the area and use them in writing a ½ to 1 page plan for the management of the area.

Part II

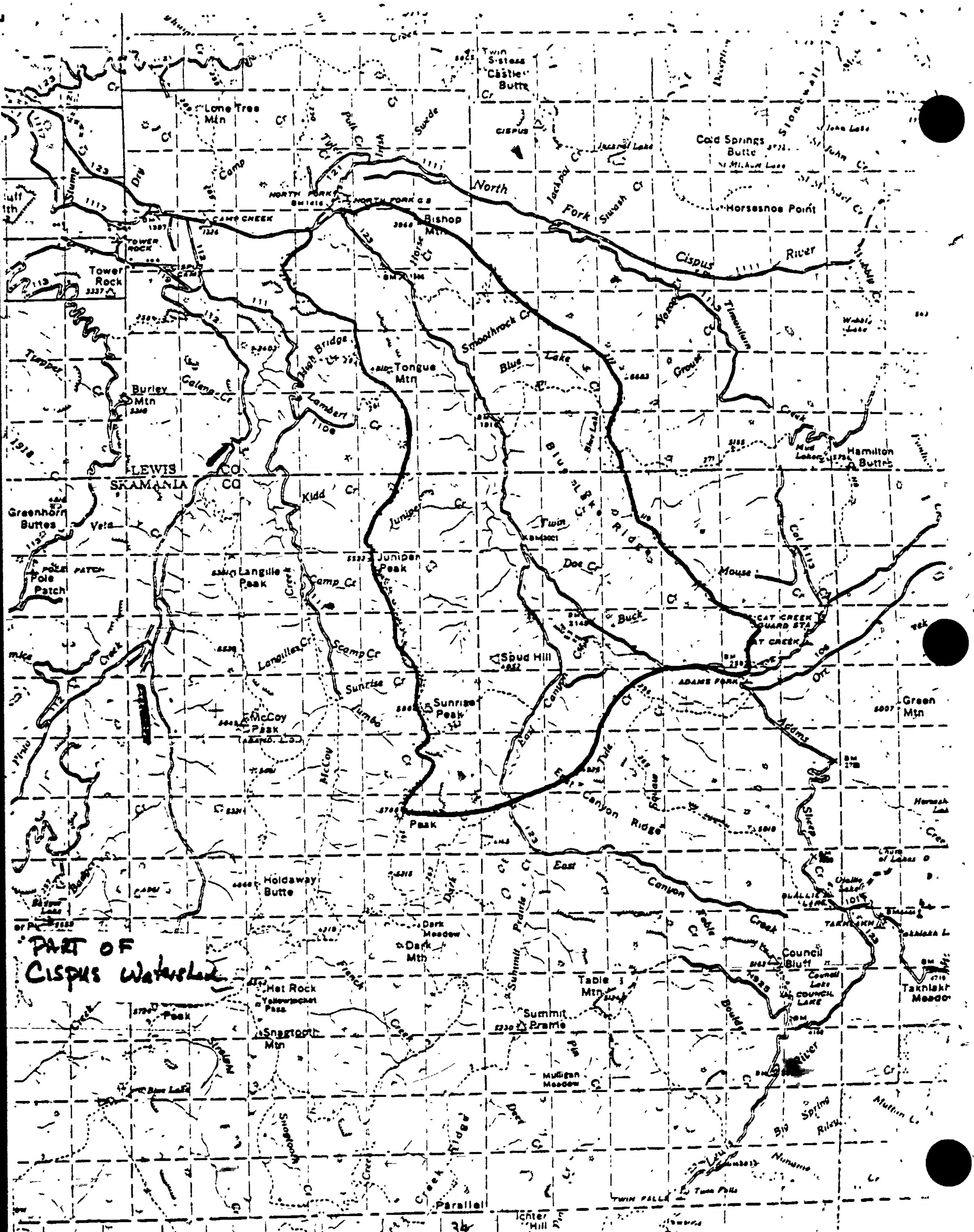
Delineate the areas on the map that will be managed for the different resources described in your management plan by using different colors to represent each resource. Make a legend.

TASK C

Make presentation of plan and map to total audience.

CONCLUSION

Resource manager of area can present his management plan of area and compare with audience presentations. Discuss similarities and differences in plans and reasons why.


PART OF
Cispus Watershed
Twin Sisters
Castle Butte
Lone Tree Mtn
Cold Springs Butte
North Fork
Cispus River
Horseshoe Point
Bishop Mtn
Tower Rock
Camp Creek
Smoothrock Cr
Blue Lake
Tongue Mtn
High Bridge
Burley Mtn
Lambert Cr
Kidd Cr
LEWIS CO
SKAMANIA CO
Greenhorn Buttes
Pole Patch
Juniper Peak
Juniper Cr
Langille Peak
Camp Cr
Langille Cr
Spud Hill
Doe Cr
Buck
Mouse
Cat Creek Guard Sta
Hamilton Butte
Adams Fork
Green Mtn
Sunrise Peak
Sunrise Cr
McCoy Peak
Jumbo
Canyon Ridge
Peak
East Canyon Creek
Holdaway Butte
Dark Meadow
Dark Mtn
Council Bluff
Council Lake
Table Mtn
Hat Rock
Yellowjacket Pass
Peak
Snagtooth Mtn
Summit Prairie
Mulligan Meadow
French Creek
Takhlakh Lake
Takhlakh Meadow
Big Spring
Twin Falls
Parallel
Blue Lake

MANAGEMENT PLAN FOR SUTTLE LAKE MANAGEMENT AREA, SISTERS, OREGON

With the increase in recreation use it is becoming an increasingly difficult management problem to resolve the different recreation activities in the Suttle Lake area.

Present user groups include:

1. Water skiiers
2. Fisherman
   a. in boats with motors
   b. in boats without motors
3. Canoers
4. Swimmers
5. Skin divers
6. Wading children
7. Campers (need more camping spots)
8. Picnickers (picknickers are using campspots, which eliminate campers from setting up camp).
9. Youth groups
10. Resort applicants
11. Horseback riders (want to use lakeshore hiking trails as well as roads and other trails).

The problem to be resolved is: do we let all users use the whole area, or do we restrict users to certain areas, or eliminate them using the area entirely.

Minimum space requirements for some uses.

1. Power boats - 5 ac. minimum for each powerboat less than 10 miles/hr.
2. Water skiers - 20 ac. for each water skier.
3. Boats with no motors - 1 ac. per boat
4. Swimmers - 400 sq. ft. of beach per person (20' x 20')
5. Campgrounds - 100' between camp spots.
6. Picnic grounds - 50' between picnic tables

Suttle Lake

1. Which uses in your estimation would be compatible on Suttle Lake?

2. How would you manage uses?
   (Plot zoning on map)

*Written by Jim Durden, U.S.F.S. Portland State University teachers at a workshop developed recommendations for management of area and presented to U.S. Forest Service.

Existing Camp and Picnic Areas

1. What is your evaluation of the condition of the existing campgrounds and picnic areas? (Are they beat out, in good condition, over used, etc. Soil compaction, dying trees, vandalized trees, tables, no screening, etc.)

2. Where can we put more campgrounds near the lake? Picnic areas? (Look at soil limitation criteria sheet.)

3. Which takes priority - picnic or campgrounds?

   Why?

4. Are resort services adequate? Are they necessary here? Why? Could that land be better used for other uses?

5. What restrictions, if any, should we place on the trail around the lake?

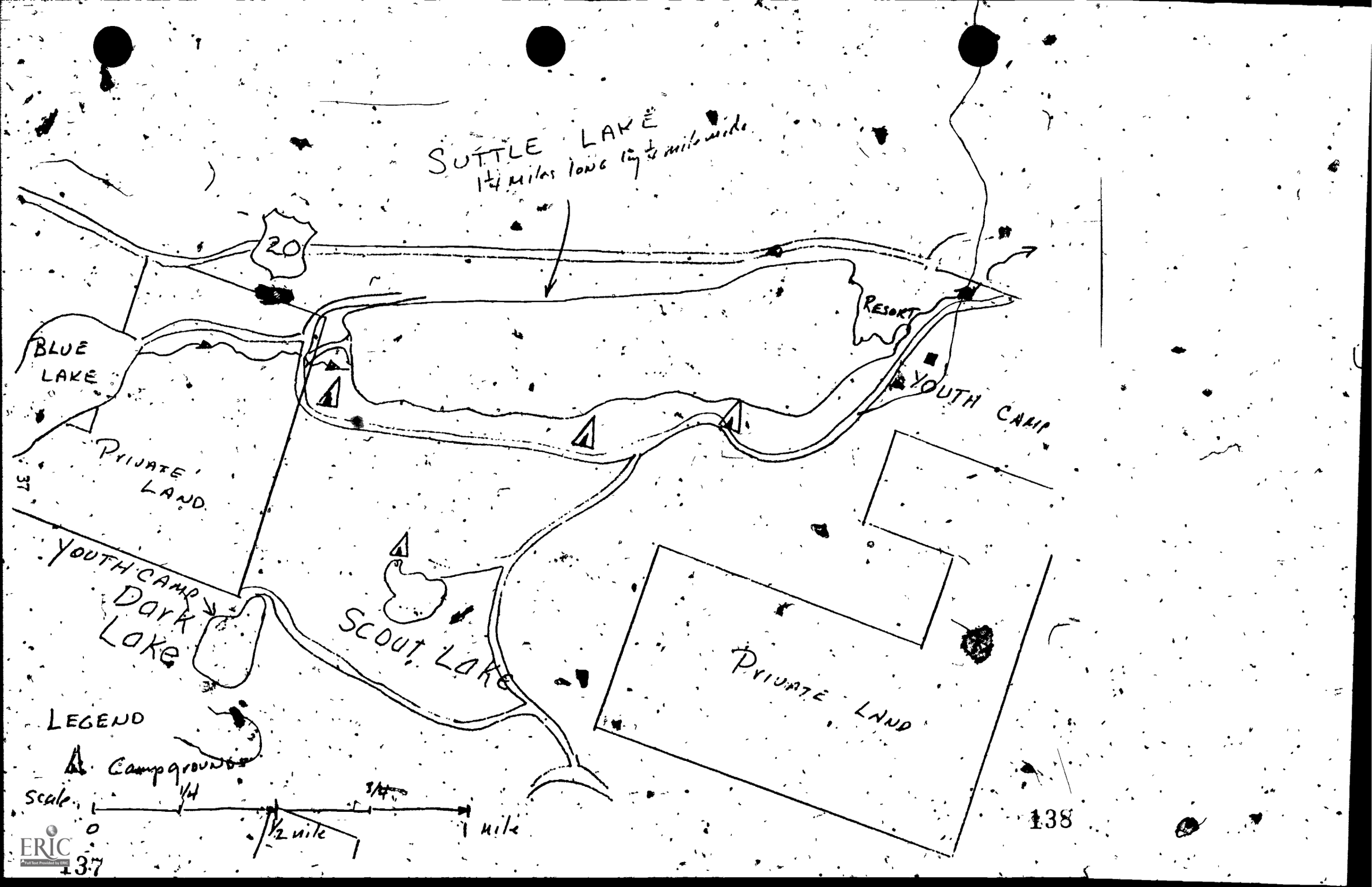
6. How are we going to manage the land between the lakes.?

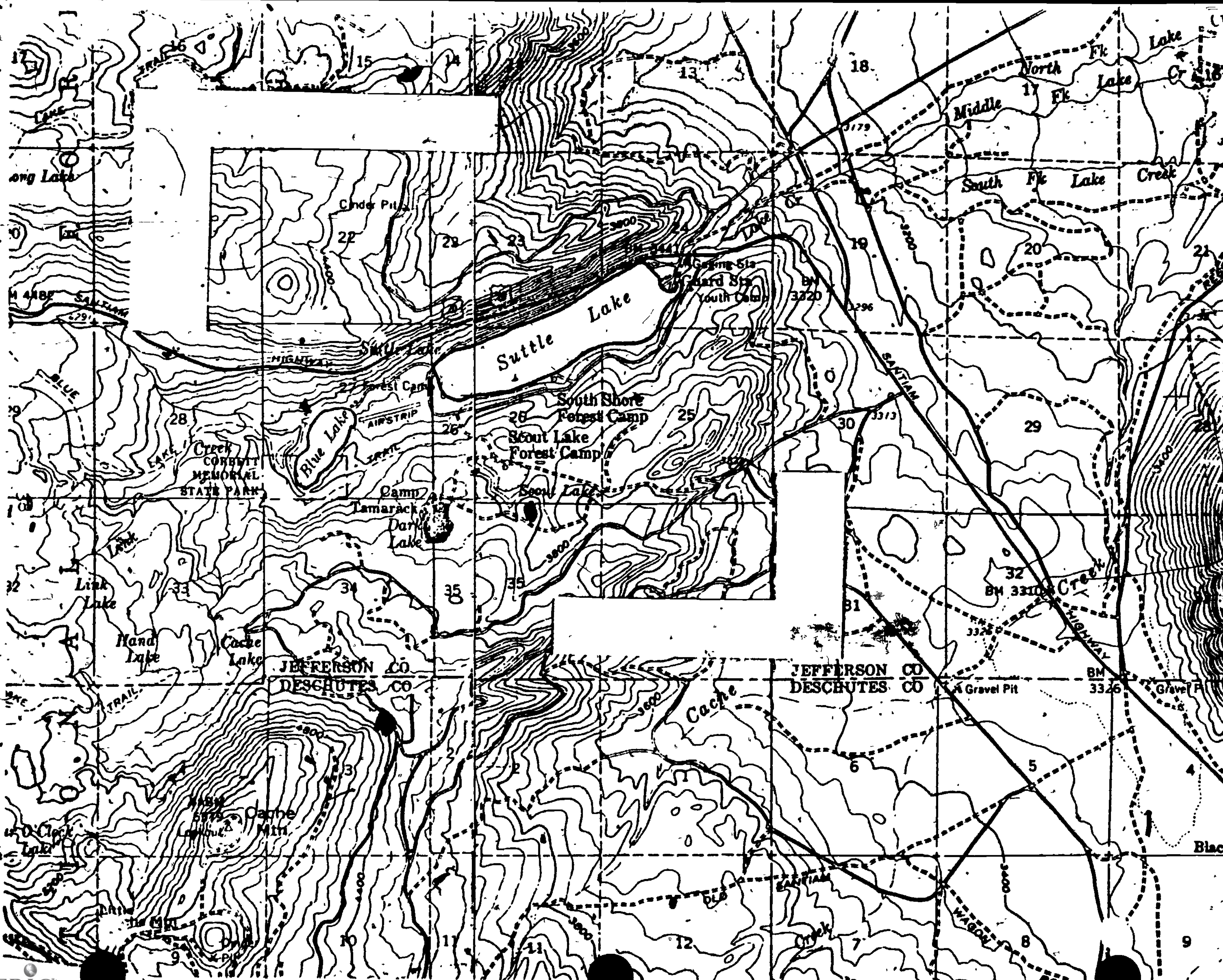
7. Scout Lake
   a. Write a prescription for the management of Scout Lake.

   b. Do you agree with the present management? Why? Why Not?

8. What should be the function of the private land in the area? (Should they be allowed to do anything they want with the land? Rock pit, timber harvest, resort, town, carnival site for kids of campers, etc.?)

9. How can we summarize what we know about the uses and management of the Suttle Lake Recreation Complex?


SUTTLE LAKE
1¼ Miles long ½ mile wide
20
RESORT
BLUE LAKE
PRIVATE LAND
YOUTH CAMP
37
YOUTH CAMP
DARK LAKE
SCOUT LAKE
PRIVATE LAND
LEGEND
Campground
Scale:
0
1/4
1/2 mile
3/4
1 mile


Suttle Lake
Blue Lake
Cinder Pits
Guard Sta
Youth Camp
South Shore Forest Camp
Scout Lake Forest Camp
Scout Lake
Camp Tamarack
Dark Lake
Link Lake
Hand Lake
Cache Lake
Cache Mtn
Lookout
CORBETT MEMORIAL STATE PARK
JEFFERSON CO
DESCHUTES CO
Gravel Pit
Middle Fk Lake Cr
North Fk Lake
South Fk Lake Creek
SANTIAM HIGHWAY
AIRSTRIP
TRAIL
OLD SANTIAM WAGON ROAD
BM 3320
BM 3310
BM 3326

MANAGEMENT PLAN.

METOLIUS RIVER RECREATION COMPLEX Sisters, Oregon

The Metolius River Recreation Complex contains 9 major campgrounds, 108 summer homes, several resorts (mostly private), a service viewpoint, a large fish hatchery, and several horse rental concessions.

Present user groups include:

Campers	Summer homes
Picnickers	Sightseers
Horseback riders	Resort clientele
Fishermen	

As a manager of this Complex, how would you resolve the following management considerations?

1. The summer homes, under special use permit, occupy prime public recreation ground in an area where use pressures are extremely heavy. On the other hand, the homes are well kept, attractive, accepted by the public, and they offer some degree of protection to the streamside zone since they are not open to the public. The following decisions are needed.

   a. Do we retain the summer homes or phase them out? Why?

   b. If the summer homes are removed, what would we use the available land for? Why?

*Written by Jim Durden, U.S.F.S. Used at teachers workshop. Through land inspection, survey interviews with user groups, etc., teachers came up with land management recommendations.

2. Taking into consideration the fact that (a) the camping experience is more socially oriented than environmentally oriented, (b) most campers utilizing the higher level sites are highly mobile and have self-contained facilities, (c) day use pressures are increasing steadily, and (d) the environment along the Metolius will be maintained, how would you provide more bedroom space (campgrounds) while increasing the number of day use sites by 10 times and maintaining the quality of the environment? (Assume that this problem has to be resolved prior to any management decision concerning the summer homes.)

3. The transportation system (road location) plays an important role in recreation use patterns. How would you change this transportation system in order to meet the high use demands and reduce the amount of unnecessary roads?

4. The Wizard Falls Fish Hatchery operated under a special use permit by the Oregon State Game Commission has proposed expanding the facility. The expansion will involve some 20 additional acres all of which are parallel to the Metolius and down river from the Hatchery. The proposed expansion area will occupy some of the highest recreation potential land along the Metolius. The Wizard Falls Hatchery site contains the highest potential for the rearing of fish in the State, and is also the most centrally located hatchery in the State. What would your decision be with regard to the following factors:

a. Should the proposed expansion be permitted? Why?

b. If the expansion were permitted, what guidelines for development should the Game Commission be required to follow?

DEVELOPING LESSON PLANS FOR ENVIRONMENTAL INVESTIGATIONS (4 hours -- inside)

(Prerequisite: at least 2 field investigations)

Participants will analyze and construct Lesson Plans involving task cards, question sequences, processes, etc. for investigating different aspects of the environment. This can be oriented toward investigating a part of the environment or toward interpreting and understanding a particular management aspect.

At the end of this session the participants will have:

1. Constructed a series of self-directed environmental investigatings using task cards.
2. Constructed a question sequence for use in helping a group interpret the data collected on the task cards in #1.
3. Identified different questions and analyze the type of responses generated by those questions.
4. Identified and classified discussion skills that can promote or restrict group participation in a discussion.
5. Constructed a Lesson Plan for an Environmental Investigation for use in a training session.

DEVELOPING ENVIRONMENTAL INVESTIGATIONS

An environmental investigation should be designed so that all participants can take an active part at their own level of ability and interest.

The investigation should have opportunities for the participant to make observations, collect and record data, make some type of interpretation of data and summarization of how those interpretations relate to the topic.

The following chapters are designed to give the participant some experiences to construct an environmental investigation.

I. Introduction Page 2
Teaching Process Skills
Survival Values in Learning
A major goal of teaching process skills is to develop the ability for each person to think for themselves.

II. Developing Task Cards Page 4 3 hours
Task cards can promote small groups and individual investigations with a minimum of teacher direction.

III. Using Questions in Environmental Investigation Page 9 1 hour
The use of certain kinds of questions can help establish a learning climate that will encourage participation, discussion and interaction during the investigation.

IV. A Basic Question Sequence for the Interpretation of Data Process Page 14 2 hours
This question sequence can allow the group to interpret their own observations and recorded data about the topic.

V. Developing a Lesson Plan for an Environmental Investigation Page 19 1½ hours
If you put all the above pieces together you can come up with the start of a lesson plan for an environmental investigation.
Hierarchy of Process.

VI. Miscellaneous (Reading) Page 21
Behavioral Outcomes
Introduction to existing "Investigating Your Environment" lesson plans, using the lesson plans.

Investigating Your Environment Series
U. S. Forest Service
Denver, Colorado

I. INTRODUCTION

Teaching Process Skills

A major goal of teaching process skills is to develop the ability within each individual learner to function autonomously at the inquiry and proof level; i.e., the ability to obtain, organize, translate, interpret and apply bodies of knowledge, and to present proof of the validity of the process.

Have group do TASK A--Survival Values in Learning Chart

1. In groups of 3-4 discuss the chart and answer the 2 questions at the bottom.
2. Have groups share their ideas about the implication of the chart.

Some Implications about the Chart: Survival Values in Learning

This chart relates to what you learn, not in comparison to how you learn it.

The lasting or survival value of learning some things may not be a very productive use of our time. According to the chart we only remember about 35% of the facts and 50% of the conceptual schemes shoved at us after only 3 months.

We retain the ability to manipulate and operate things (machines, tie shoes, write, etc.) up to 70% of the learning experience. If the learning experience were designed for us to develop thinking skills and processes (gather, sort, analyze, interpret and provide alternate solutions about problems) we could retain those skills at the 80% level of usefulness.

Therefore, we might assume that a person who has developed the ability to think for himself can collect and analyze factual data, develop a line of reasoning or contribute to the interpretation or solution of a problem or decision. Many times the learning experience deals only with memorizing facts and other information or concepts with no chance for putting that knowledge to work for us.

Before planning a workshop and other learning experiences, ask yourself--

1. What am I doing this for?
   To help people memorize facts, learn concepts or to think for themselves?

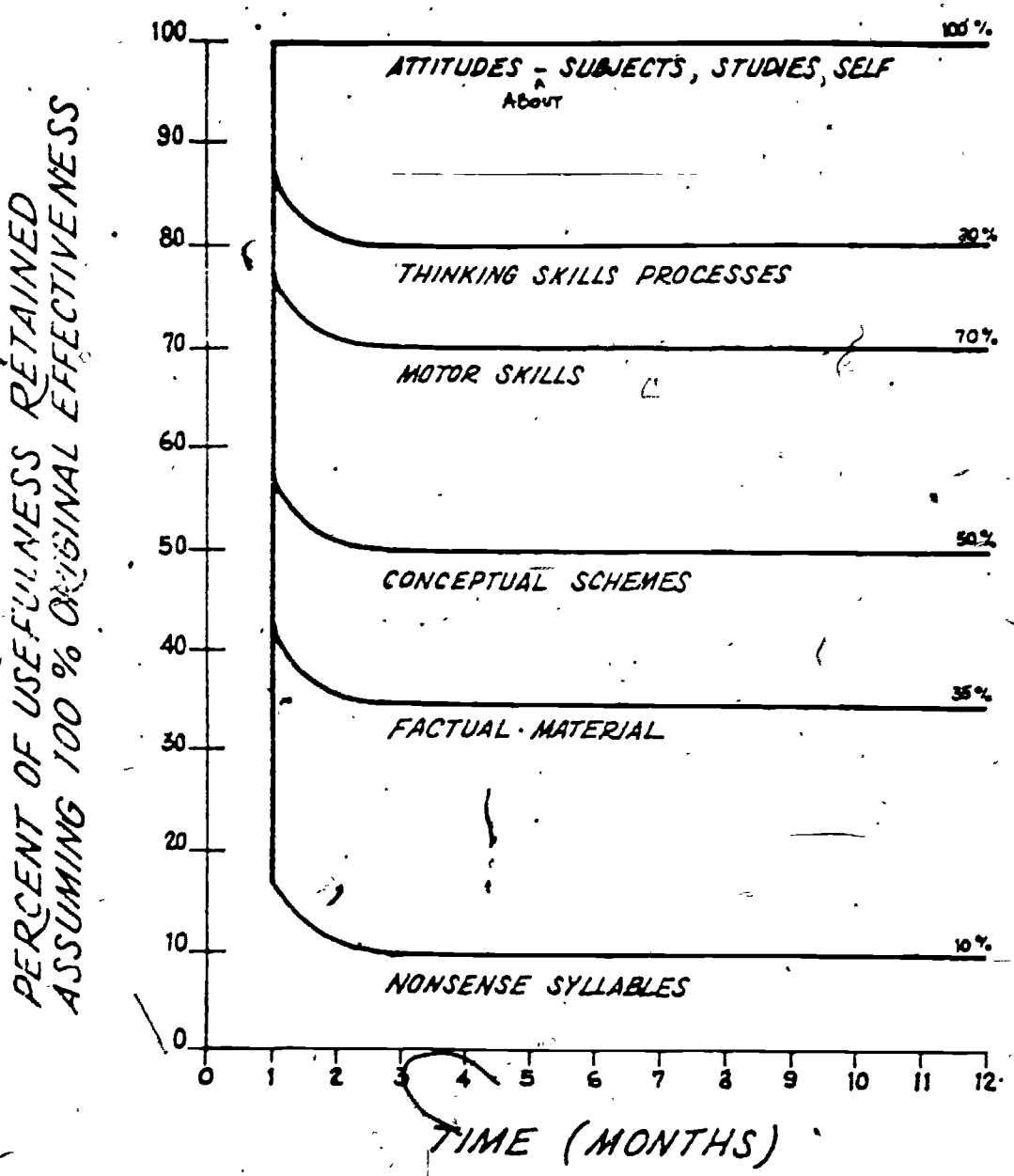
2. How can I structure learning experiences to insure participation and the development of thinking processes along with the use of factual data, etc.?

   We are now recognizing that if we develop thinking skills and processes of investigation, we may begin to change behaviors. Only by actually involving people in environmental learning experiences can they begin to think about their role in environmental management. We must be concerned with developing environmentally literate persons who can think for themselves.

TASK

Survival Values in Learning

Used in the Higher Level Thinking Ability Course - N.W.E.R.L. - as an interpretation from Educational Psychology, Cronbach Harcourt Brace & World 1963.



This chart shows the retention rate of different categories of learning. In small groups discuss and answer the following questions.

What does this chart say about the retention of learning?

What are the implications of this chart to the way we plan learning experiences?

II. DEVELOPING TASK CARDS

In developing an Environmental Investigation Lesson Plan, self-directed task cards can be a useful tool. They can promote individual and small groups data-collecting and interpretation.

Task cards are not new and have been used in many ways. A task card can be simply a card on which you write the directions for a learning experience.

Questions and discussions

1. Pass out examples of task cards. Example: Use examples of Investigating your Environment Task cards, Milwaukie School District cards, American Geological Institute, ("Essence")

> Task A (30 minutes) (groups 4-6)
>
> After looking at the task cards, that you have, list some reasons for using this method as one instructional help.
> Examples:
> 1. allows for different levels of ability to participate at once.
> 2. easily adjustable--can add or delete tasks
> 3. can promote small groups interaction and accomplishment
> 4. teachers do preparation ahead of time
> 5. don't feel bound to manual
> 6. can tailor-make investigations to fit needs of students
> 7.
> 8.
> 9.

2. Make a composite list on the basis of all the groups contributions.

3. Point out that task cards can also have the following characteristics:

   Sequential, programmed, assorted, self-directed, personalized, task oriented, etc.

   Provide for a variety of kinds of--involvement, communication, feedback.
   Provide alternatives and choices for the learner--laminated for wet weather.

4. Ask the group if they can think of any other characteristics.

5. Have groups do Task B.

TASK B (30 minutes) (groups 4-6)

List other topics for task card ideas in the following grades.

Suggested assortment as samples:

Kindergarten - Primary (K-3)
- Assorted topics based on observation, using the senses--
  - sense of touch
  - shapes
  - colors
  - sounds

Intermediate grades (4-6)
- Assorted topics based on schoolyard and curriculum enrichment activities--
  - developing observations (same as above)
  - language expression
  - schoolyard land use
  - how-you-feel-about-the-schoolyard-type-activities
  - science-of-the-schoolyard-type-activities

Non-graded (could be for any level to adults)
- Assorted topics following an environmental action approach--
  - developing and conducting a litter campaign
  - inventory sources of Air Pollution
  - improve your neighborhood
  - consumer studies
  - observe and interpret some aspect of management (wildlife habitat, timber management, stream survey, etc.)

6. List additional (on the board) ideas for each category, in Task B, from the groups. (If time allows.)

TASK C. (15 minutes). (small groups)

Using the following criteria, evaluate the sample task cards below:

1. Does the activity actually involve the learner in the environment? How?
2. Is the activity relevant to the learner in his world? (age level, topic, etc.)
3. Does the activity include opportunities for problem solving?
4. Does the activity include opportunities for the learner to collect and record data based on his own observations?
5. Does the activity include opportunities for the learner to make his own interpretations about the data he collects?

SAMPLE TASK CARDS

Circle the # for the criteria present on card

(From an assortment of task cards for a nature trail walk)

Here are two leaves.
Make a list of all the similarities you find.
Make a list of all the differences you find.
(Staple leaf here) Leaf 1 (Staple leaf here) Leaf 2
Similarities:
Differences:

1 2 3 4 5

(From a sequence of task cards on "Sounds")

Find a noisy place and stay there for a little while.
How do you feel in a noisy place?
Write a few sentences or a poem to tell how the noisy place makes you feel.

1 2 3 4 5

(From a sequence of task cards on "Spaces")

Walk around your classroom.
How do you feel in this space?
Write or tell about how it makes you feel.

Go outside and stand near the school building.
Do you feel different here than you do inside?
Write or tell how this space makes you feel.

1 2 3 4 5

(From a unit of study for a "Supermarket Survey")

In your backyard or schoolyard, bury different kinds of packaging materials. Dig them up at specified intervals of time and compare decomposition rates.

	Alum. Can	Glass Bottle	Plastic	Cardboard	Etc.
Sept.					
Oct.					
Nov.					
Etc.					

1 2 3 4 5

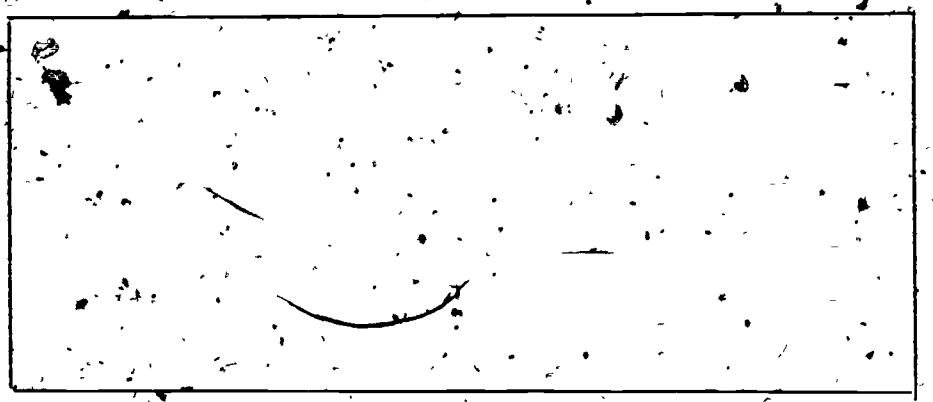
TASK D

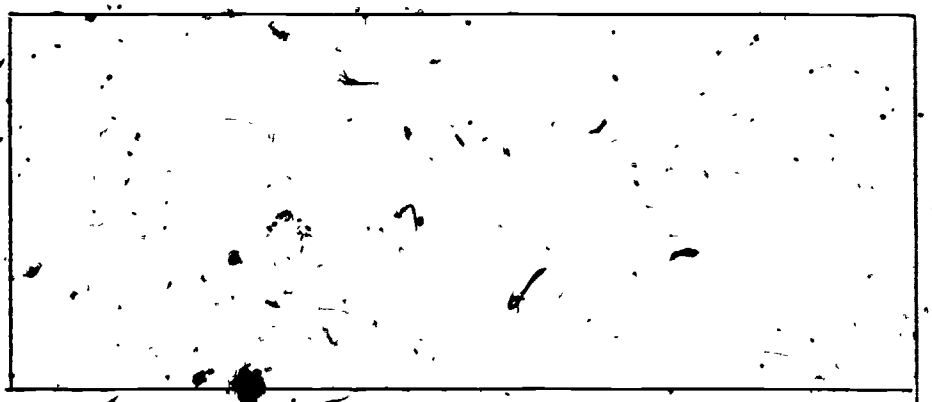
In small groups (3-4) construct at least two task cards on a topic of your choice.

Some suggested Instructions for Cards:

select a topic or theme or a particular environment
decide on your purposes
select some activities to accomplish those purposes
construct task cards below about the topic or theme you chose
consider including a variety of types of involvement
- -sizes of groups
- -lengths of time
- -methods of recording or communicating information

When you finish, evaluate another groups' task cards using the criteria from TASK C.





Questions and Discussion:

1. Have several articles of one page in length on environmental problems such as noise pollution, resource management, etc., and have small groups develop task card investigations from the article that meets some of the criteria from Task C.

2. Now that you have examined and constructed several task cards, what guidelines would you write for another group of teachers to use in developing task cards?

Some example responses:

a. have one specific goal
b. keep task brief enough to maintain interest and sequence
c. color code them by areas of study or ability
d. keep directions simple
e. should fit within a time limit
f. some form of self-evaluation statement
g. use processes of observing, collecting, recording, and interpreting data

III. USING QUESTIONS IN ENVIRONMENTAL INVESTIGATIONS

One objective in learning is to help people develop thinking skills and processes that will allow them to interpret the data they collect. A good discussion and a good learning experience will happen if appropriate questions are asked. The use of certain kinds of questions can help establish a learning climate that will encourage individual participation, group interaction, and interpretation of the information collected in the investigation.

1. Ask each of the four questions below. Have each person write down as many things they can think of after each question. After they have written their answers to each question, ask how they felt about answering that question. Discuss.
   What would happen if the rainfall doubled in your state next year?
   How many acres of land in your state?
   Why are recreation lands in your state important?
   What are some things you think should be done in Environmental Education in your state?
2. Pass out TASK A (below)

TASK A (15 minutes)

Get into groups of 3-4 and answer the following questions about the four questions that were asked of you.

a) Which of the four questions below did you feel most comfortable answering?
   1 2 3 4 Why?

b) Which question did you feel least comfortable answering?
   1 2 3 4 Why?

c) Which question allowed for greatest participation?
   1 2 3 4 Why?

Questions asked:

Question #1 - What would happen if the rainfall doubled in your state next year?

Question #2 - How many acres of land in your state?
(What is the highest mountain in the United States?)

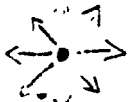
Question #3 - Why are recreation lands in your state important to the economy?
(What are the reasons for the location of (major city)?)

Question #4 - What are some things you think should be done in Environmental Education in your state?
(In your opinion, what is the major problem facing the environment today? Tell why.)

3. Ask for verbal answers and discussions from the total group about TASK A.

4. The following is background information on the questions in TASK A. You may want to read it, or summarize it according to how the group discussion goes.

Some people think that if you just ask questions, your problems are solved as far as getting involvement and group interaction. Asking questions doesn't necessarily insure more participation, better interaction, or higher levels of thought processes. The kinds of questions you ask and when you ask them is important. As you can see from TASK A, different kinds of questions get different kinds of responses.

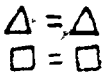


Many Systems

Question 1 - What would happen if the rainfall doubled in your state next year?

This divergent type of question provides the opportunity to consider many different systems and try out many answers.

If you ask a question that asks for a wide variety of responses, you'll probably get a wide variety of responses and the participation will be more free. This allows more opportunity for creativity and imagination. (What would happen if.....? How might.....? What do you see.....?)



Memory or recall

Question 2 - How many acres of land in your state?

This memory type question calls for remembered content, rote memory, or selective recall.

If you ask a question that has one correct answer, then people will go after the correct answer or the answer they think the leader is looking for. The kind of thinking that is going on is the recall of previously learned information and facts. (Who is.....?, What is.....?)

Many factors affect one topic

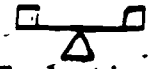
Question 3 - Why are recreation lands in your state important to the economy?

This convergent type question represents the analysis of given or remembered information. It leads to one expected end result or answer.

If you ask a question that focuses on solving a problem or putting several pieces of data together, then the audience has to reason, using given or remembered data. (Why are these things so.....? How do you account for.....?)

The participant becomes a problem-solver in which the task is to apply the proper operations at the proper time.

Question 4 - What are some things you think should be done in Environmental Education in your state?



Evaluative

This evaluative type question asks the participato[illegible] use judgment value, and choice, and is characteriz[illegible] by its judgmental quality.

The type of question you ask then, can affect the learning atmosphere and restrict or motivate the participants to become involved in the discussion.

5. Have Group do TASK B

a) Which questions are similar? (Not in their content, but in the kind of responses they would receive)

b) Put the questions that are similar into groups.

c) Label (give name to) each grouping of questions.

d) Use these labels to fill in the first column on the following chart.

e) Complete the chart.

TASK B (30 minutes)

1. In groups of 3-4, identify the following questions that are similar. (similar in the kinds of responses they would receive, not in the content)

____a. What is a nuclear reactor?
____b. Why are the demands for energy doubling every 10 years in the U.S.?
____c. How do you account for the decreasing amount of open space in your community?
____d. What do you think is the best use of this land?
____e. Name the largest city in your state?
____f. Should numbers of coyotes be controlled? Why or why not?
____g. What would happen if all automobiles were banned within the Seattle city limits?
____h. How much land has been taken out of agricultural production in the U.S. in the last 5 years?
____i. What effect do trees and shrubs have on noise abatement?
____j. What factors contribute to the traffic congestion problem in your community?
____k. In your opinion, what are the 3 most important problems in your community?
____l.

2. Put the numbers or letters that represent each group identified in the chart below and label each group.

Groups	Label each group of questions using your own names

3. Put your labels in the chart below and describe your groupings.

Kinds of Questions (use the names you gave the groupings)	Characteristics of questions in this group

What does your chart tell you about the use of questions?

1.

2.

3.

Questions and Discussion:

1. Discuss TASK B and particularly--What does your chart tell you about the use of questions? Ask different groups what ideas they come up with.

2. Here are some ideas to add to the groups comments:

   The kind of questions you ask affects the involvement level and atmosphere (bored, stuffy, uncomfortable, excited).

   The type of questions you ask can affect the number and type of responses you get from a group.

   Different types of questions can be used at different times in the course of a discussion.

   The kind of thinking that takes place can be affected by the kinds of questions being asked.

   The level of discussion within the group can be affected by the kinds and sequence of questions being asked.

   If you are aware of the difference in the kinds of questions, you can do a better job of analyzing the responses.

   Good discussions don't happen by accident.

3. Let's explore a basic question sequence usable as a part of Environmental Investigation.

   (See -- A BASIC QUESTION SEQUENCE FOR THE INTERPRETATION OF DATA PROCESS).

IV. A BASIC QUESTION SEQUENCE FOR THE INTERPRETATION OF DATA PROCESS

It can be important to develop a basic question sequence to allow people to interpret their own observations in the interpretation of data process.

There are four basic question categories that can be used in this process. Select a topic (common to all) about which they should write the questions. It could be something in the immediate area or room.

1. Open Questions

Designed to provide an opportunity for all persons to participate and to obtain a body of specific data which will provide the opportunity to focus on significant points.

This type of question provides an opportunity for every person to become immediately involved in the discussion, regardless of his ability or background. It is completely free of the element of "guess what's on my mind."

THE CHARACTERISTIC OF THIS QUESTION IS OPENNESS

"What do you see as you look at the hillside?"
"What did you see on your walk in the city?"
"What do you notice about the soil profile?"

List two open questions that you would use to allow as many people as possible participate in a discussion:

_____

_____

Note: Interpreation of data may not necessarily begin with an open type question. You may wish to focus immediately upon specific points in the data. In that case, begin the question sequence with a focus question.

2. Focusing Questions

The focusing question is an extremely important element in the interpretation of data process. It focuses on specific points that will later be compared, contrasted, and related to other points.

Its basic purpose is to focus the attention on specific data as a central point for discussion.

THE CHARACTERISTIC OF THIS QUESTION IS SPECIFICITY

"What are some things that are helping the log decay?"
"What are some things that affect the quality of water?"
"What are some possible reasons for this change?"

List two focus questions that you would use to focus in on a specific point for discussion.

_____

_____

3. Interpretive Questions
Designed to compare, contrast, and seek logical relationships between the specific points brought out in the focus question(s).

The learner is asked to compare and contrast two or more specific points in the data; two or more groups of data; two or more feelings, concepts, or ideas, and express a perceived or inferred relationship between them.

THE CHARACTERISTIC OF THIS QUESTION IS ITS FOCUS ON RELATIONSHIPS
"Are there any of these that seem to belong together?"
"What can we say about the PH of water from the aquatic life found there?"
"How do you account for the differences between these two areas?"
"Why were the two trees the same age but different in size?"

List two interpretive questions that you would use to seek relationship between specific points.

_____

_____

4. Capstone Questions
Designed to obtain conclusion, summary, close.

It occurs at the close of a particular discussion and calls for a statement which summarizes in a generalized form what has been discussed so the generalization or big idea applies to a variety of situations. It calls for a conclusion, generalization, or summary.

THE CHARACTERISTIC OF THE CAPSTONE QUESTION IS ITS CONCLUSIVENESS
"How could we summarize on discussion about architecture?"
"Based on our observation and discussion, what can we say about water environments?"

List two questions you would use in summarizing or closing a discussion.

_____

_____

Questions and Discussion:

1. Get into groups of 4-6 and do Task A.
2. Ask for examples groups have come up with.
Discuss--ask if it fits criteria listed on Task A

TASK A (15 minutes)

In small groups (4-6) write down two examples of each of the four major question categories you have been asked in field investigation sessions so far.

OPEN (allow everyone to participate. Get out a lot of data)

1.

2.

FOCUS (focus attention on specific data as a central point for discussion)

1.

2.

INTERPRETIVE (seeks relationships--compare, contrast, relate specific points in the data)

1.

2.

CAPSTONE (calls for a statement which summarizes what has been discussed)

1.

2.

Questions and Discussion:

1. Show film--(Environmental Awareness--11 minutes)

2. Involve the audience in discussing the film using one of the following question sequences.

Examples of Two Question Sequence
for
The Environmental Awareness Film

Here are three sets fo questions for a discussion leader's use in helping people discuss their thoughts about their environment.

a. Purpose: To explore different implications of the word "environment."
What did you see in the film?
What were the different kinds of environments shown in the painting?
What were some of the things that were similar in each environment?
What does the word "environment" mean?

b. Purpose: To explore some effects of change in the environment.
What did you see in the film?
What were there changes in the environments in the film?
What things were affected by changes in the environment?
How can we summarize our discussion about change in the environment?

3. Pass out Task B and have the audience identify, list and discuss the four major question categories just used in discussing the film.

TASK B

Identify, list and discuss the four major questions used to discuss the film.

_____ Film

	QUESTIONS (List four major questions asked by leader)	State PURPOSE of each question
1.	1.	
	2.	
	3.	
	4.	

DEVELOPING YOUR OWN QUESTION SEQUENCE FOR INTERPRETATION OF DATA PROCESS

1. Show another short film (eg., Tree House, Sparkle, Garbage)

2. After film pass out Task C and have each group write a question sequence.

TASK C (20 minutes)

Working in groups of 3, construct a purpose and question sequence to use in discussion of the film just seen.

CRITERIA TO EVALUATE INTERPRETATION OF DATA QUESTIONS

Open - Allow everyone to participate. Get out allot of data.
Focus - Focus attention on specific data as a central point for discussion.
Interpretation - Seeks relationship. Compare, contrast, relate specific points in the data.
Capstone - Calls for a statement which summarizes what has been discussed.

_____ Film

Purpose of showing and discussing film: _____

_____

Open question: _____

_____

Focus: _____

_____

Interpretive: _____

_____

Capstone: _____

_____

(Questions must relate to the purpose of discussing the film on whatever the subject is)

3. Have each group share and evaluate their question sequence with another group. (30 minutes)

V. DEVELOPING A LESSON PLAN FOR AN ENVIRONMENTAL INVESTIGATION

Working in groups of three, select one thing on this site to develop an Environmental Investigation about.

Group members: _____ _____ _____

Purpose of Investigation: _____

_____

Evaluation: Is the purpose clearly defined? Yes No
Is it too general to be workable? Yes No

Pre-investigation questions, questions designed for maximum group responses and interaction--What can we find out about that rotten log? What would be important to look at?

_____

_____

_____

_____

_____

Evaluation: Will the pre-activity question create interest and motivation to the audience to gather data? Yes No
Are the questions varied? Yes No

Task Card

Directions for gathering data for the investigation:
(See sheet Data Collecting Guidelines for Environmental Problem Solving)

_____

_____

_____

Data recording for the investigation (types of instruments, charts, graphs, tables, description, etc.):

Evaluation: Does the activity gather data that will help support the purpose? Yes No.
Does the activity actually involve learner in collecting and recording data? Yes No.
Does the activity include opportunities for learning to make his own interpretations? Yes No.

Post Investigation Discussion

Open Question to bring out the "What's" (What did you notice?, What did you see?, etc.)

1. _____

_____

Focusing Question on specific points to be compared, contrasted, or related to other points of specific data (How do you account for ..?, Why are these things like that?)

1. _____

_____

2. _____

_____

Interpretive Questions to elicit comparing, contrasting, and relating of points within the field of data--What differences did you notice between rotten logs of the two different trees?

1. _____

_____

2. _____

_____

3. _____

_____

Capstone Question for summarizing generalizations--What can we say about..? How can we summarize what we've done and discussed about the rotten log study?

1. _____

_____

Evaluation: Does the question sequence lead the people to make generalizations that coincide with the purpose?
Does each of the questions in the question sequence match up with the criteria below?

Open - allow everyone to participate. Get a lot of data.

Focus - focus attention on specific data as a central point for discussion.

Interpretive - seeks relationships. Compare, contrast, relate specific points in the data

Capstone - calls for a statement which summarizes what has been discussed.

VI. MISCELLANEOUS

BEHAVIORAL OUTCOMES

Many instructional specialists contend that the single most important instructional advance of the past several decades is the current quest for clarity in the statement of educational outcomes. Today more than at any previous time in educational history, educators are being urged to clarify the descriptions of the outcomes they hope to achieve through their instructional efforts.

It is important that we be able to distinguish between instructional objectives which are well formed and those which are not. Well formed objectives possess a tremendous advantage over other objectives in that they reduce ambiguity. This ambiguity reduction leads to significant dividends in planning instruction and evaluation. The less ambiguity that surrounds a statement of an educational outcome, the more cues we have regarding what kind of instructional sequence will prove effective. The less ambiguity, the more readily we can devise precise measures to reflect that outcome. Well formed objectives thus constitute a useful mechanism for improving instruction and evaluation.
(From stating educational outcome S W Regional Laboratory for Education R & D)

SOME GUIDELINES FOR DEVELOPING OBJECTIVES OR PERFORMANCE TASKS

1. An objective describes an expected change in the learner's behavior.
2. When the learner has DEMONSTRATED this behavior the objectives have been achieved.
3. An objective is a group of words and symbols which communicate the expectation of the learner so exactly that the others can determine when the learner has achieved it.
4. A meaningful stated objective, then, is one that succeeds in communicating your expectation for the learner.
5. The best objective is the one that excludes the greatest number of possible alternatives to your goal. (No misinterpretation)

Cromwell Park School, Shoreline, Wash.

CRITERIA TO EVALUATE OBJECTIVES

1. Have you identified who the learner is?
2. Have you described the behavior the learner will demonstrate as evidence that he has achieved the performance task?

   Is it measurable action or performance by the learner? (see list of Action Words)

3. Have you stated the conditions you will impose upon the learner when he is demonstrating his mastery of the performance task?

Examples:

- using the length of his own step he will demonstrate_____
- given a list of rocks he will distinguish_____
- given a set of tree samples he will construct a dichotomous key_____
- using a highway map of his state he will describe_____

ONE WAY TO SET UP YOUR OBJECTIVE

INSTRUCTIONAL OBJECTIVE: (put in phrases)

What will the learner by DOING?	Write:
What CONDITIONS will be imposed?	
How will success be RECOGNIZED?	

Now write the complete instructional objective below, evaluating it with the criteria above.

Select the statement in each number below that best describes what the learner will be DOING when demonstrating his achievement of the performance task.

1. Describe various things observed in nature.

2. Describe accurately a land area.
   Construct a map of a predetermined land area by using compass bearings and distances.

3. Develop an appreciation of the aesthetics of our environment. Identify one thing in your environment that makes it more beautiful to you.

4. Demonstrate needed operations to calculate height of tree. Demonstrate how to measure the height of a tree using a stick longer than your arm.

ACTION WORDS

Here are nine action words from the American Association for the Advancement of Science that apply to curriculum related activities in the environment. These are not the only usable action words.

Identify - The individual selects a named or described object by pointing to it, touching it, or picking it up.

Name - The individual specifies what an object, event, or relationship is called.

Order - The individual arranges three or more objects or events in a sequence based on a stated property.

Describe - The individual states observable properties sufficient to identify an object, or relationship.

Distinguish - The individual selects an object or event from two or more which might be confused.

Construct - The individual makes a physical object, a drawing or a written or verbal statement (such as an inference, hypothesis, or a test of any of these).

Demonstrate - The individual performs a sequence of operations necessary to carry out a procedure.

State a Rule - The individual communicates, verbally or in writing, a relationship or principle that could be used to solve a problem or performs a task.

Apply a Rule - The individual derives an answer to a problem by using a stated relationship or principle.

BEHAVIORAL TERMS

The majority of our educational objectives can and should be stated in behavioral terms. It is recognized that there are some meta-objectives which must be more subjectively stated and performance subjectively measured. The terms listed below represent an effort to formulate a list of the most common and applicable terms which have meaning for the teacher developing objectives related to the areas of knowledge, skills and habits, understanding and concepts.

1. Describe
2. Interpret
3. Observe
4. Demonstrate
5. Sketch
6. Identify
7. Compare
8. Translate
9. Contrast
10. Relate
11. Generalize
12. Formulate
13. Define
14. Locate
15. Express
16. Analyze
17. Apply
18. Operate
19. Illustrate
20. Diagram
21. Perform
22. Listen
23. Write
24. Read
25. Review
26. Use
27. Present
28. Discover
29. Support
30. Question
31. Create
32. Calculate
33. Organize
34. Develop
35. Recite
36. Differentiate
37. Construct
38. Solve
39. List

TERMS TO AVOID IN STATING BEHAVIORAL OBJECTIVES

1. Enjoy
2. Appreciate
3. Faith
4. Understand
5. Like
6. Know
7. Grasp

Introduction to the Series of Lesson Plans,
"Investigating Your Environment"

The development and use of environmental investigations in this series are designed to help you take an in-depth look at different component parts of your environment. The investigations were developed after several years of field-testing with teachers, resource people, and students for use in environmental education training courses for teachers and resource people.

The lesson plans provide a structure to learning in that one activity builds on others and leads to some concluding environmental interactions. It also provides freedom within the structure for the student to observe, collect, and record meaningful information at his own pace through the use of the self-directed task cards. This changes the role of the teacher from that of a dispenser of facts and information to that of a facilitator, motivator, and learner along with the student.

These lessons also provide for a maximum of student response and summary because of the discussion and question sections.

The activities used are not replicable in all environments. You will have to develop activities appropriate to the environment in which you are investigating.

The authors of these lesson plans felt it was important to include the following elements:

Processes

The processes of both data collecting and group problem solving are the first step toward understanding important generalization and big ideas about the environment. The processes used in these lessons can be replicated and are transferable in any environment: (Collecting observable data, making inferences, setting up investigations to check out inferences, communicating feelings and awareness.)

Self-Directed Task Cards (including analyzing charts and tables)

Self-directed task cards are used to accomplish certain activities without the aid of the instructor. Some could be removed from the rest of the lesson plan and used as isolated activities for shorter periods of time. Some analyzing charts and tables are provided so student can interpret his own data collected and check out his inferences made during the investigations. Look for opportunities for students to construct their own data interpretation charts into their task cards.

Using Questions in Environmental Investigations

Discussion questions are used as introduction to activities or as summary follow-up to activities. (This minimizes instructor explanations and involves the participants in contributing their thoughts and information.)

Summarizing Questions

The summary questions used at the end of certain tasks and at the end of the session are one of the most exciting and important parts of each lesson. These questions are designed to:

1. 1. ALLOW PARTICIPANTS TO DISCUSS THE IMPLICATIONS OF WHAT THEY LEARNED TO THE MANAGEMENT OF THE ENVIRONMENT.
   2. ALLOW PARTICIPANTS TO GENERATE THEIR OWN CONCEPTS AND GENERALIZATIONS ABOUT WHAT THEY HAVE DONE.

Behavioral Outcomes

The behavioral outcomes for each lesson indicate some minimal expectations in acquiring new knowledge and skills and indicate the nature of expected outcomes in feelings, awareness, values, and action about the environment.

USING THE LESSON PLANS

The guidelines listed below are designed to help you involve people in environmental investigations. They are in no way "sure fire." You may have to change some of them to adapt to your situation and you may want to add to or delete from the list.

Make sure you have all your materials and equipment ready and that you have visited the necessary parts of the environment you will use in your investigations. Is there sufficient amount of equipment and is it all in working order? How are you going to check it out and make sure you get it all back.

Some guidelines:

1. Go over quickly with your students what will take place during your session so they will know what to expect.

2. Use the lesson plan outline as a guide involving questioning strategies and self-directed investigations. Revise as necessary to fit your situation.

3. Minimize teacher talk and/or lecture. (use question sequence and discussion skills sections of outline)

4. Plan and pace your session so that what you do is done thoroughly and well. Don't have your lesson so rushed that you have to give out data all the time. If you have a time restriction, make sure you decide ahead of time which TASK's you are going to eliminate.

5. The summarizing question and discussion area of how this relates to man and the management of the environment is so important that you should plan to start the summarizing and discussion area of the session at least ½ hour before dismissal. Conclude the session with the summarizing questions or equivalent at the end of the lesson plan. (This is one of the most important parts of the activity). This will give you an evaluation tool to see what generalizations or concepts students can generate.

6. Have class discuss and list in small groups ways in which the study activities can help change behaviors. Groups may share ideas.

7. Assign one or two students to be accountable for equipment at the beginning of each session. (Have the same people be responsible for cleaning up the the equipment at the end of each session).

8. Be thinking of ways your lesson can be integrated into the curriculum when you return to the classroom. What kind and how much follow up are you going to do.

9. When your session is finished, jot down strengths and weaknesses so you can revise your lesson so it will be better next time.

The authors feel the ideas written here will suggest new ways of using your environment for learning, and that the activities and ideas will never really come to life until you have modified and changed them to fit your own needs.

As in any important learning experience, the instructor should go through the lesson plan and the environment in which the activity will take place before introducing it to the students.

I Hierarchy of Process*

The development of thinking ability may be considered in relation to the following hierarchy of process:

Application of the other skills.	Ability to function autonomously with both inquiry and proof. Consciously aware of the skills within the process and able to employ them without assistance from others.		5. Autonomous Inquiry
Development of these abilities is commonly developed using Questioning Strategies	(What might happen if water came to the desert?)	4. Application	The intellectual process of making logical application of known data to a new situation.
	(Based upon how these two groups of people lived, what might be true of other cultures?)	3. Interpretation (Generalization Level)	The intellectual process of relating specifics, examining relationships and generalizing from known data.
	2. Translation (Concept Level)	The intellectual process of translating specific knowledge into a parallel form. (Could you put that in your own words?)	
	1. Memory (Factual Data Level)	The intellectual process of recalling and verbalizing specific information in the same form in which it was originally presented. (What is the definition of a proper noun?)	

*The above hierarchy of thought process has been taken principally from two sources:

1. Bloom, Benjamin S., Taxonomy of Educational Objectives, Handbook I, Cognitive Domain, David McKay Co., New York, 1956.
2. Sanders, Norris M., Classroom Questions, What Kinds? Harper and Row, New York, 1966.

(Those who are familiar with these sources will recognize that synthesis or creative thought processes, and evaluative thought processes have not been included. While these two additional processes are considered extremely important, the following materials deal exclusively with the first four levels of the hierarchy.)

The sequence of activities in constructing Environmental Investigations has been developed over several years of workshops and training sessions. It is a collection of a few items that can be useful in developing your own investigations with groups and classes. Many people have contributed to this lesson with special thanks to Mr. Dick Phillips, Milwaukie School District, Oregon.

This lesson plan was revised in February 1973. It is suggested that continuous revision take place by the people who use the ideas.

TECHNIQUES OF GROUP INVOLVEMENT (4 hours -- inside)

Participants will be involved in a variety of activities that illustrate methods of obtaining a high quality of individual and group participation at meetings.

The activities relate to topics such as: meeting environments, size and arrangement of groups, shared leadership, stages of group growth, roles played in groups, communication skills (listening, asking, responding), involvement activities for different purposes, keeping track of input (charting, recording, data retrieval, summarizing, preparation, follow-up).

At the end of this session participants will have:

1. Described at least 10 different ways to maximize individual and group participation at meetings and other sessions.
2. Identified steps necessary to plan for group participation at meetings.
3. Developed a plan of action for conducting a session that will provide an opportunity for all individuals to participate in a meeting.

LESSON PLAN FOR IDENTIFYING SOME TECHNIQUES OF GROUP INVOLVEMENT

The activities in this Lesson Plan have been developed and used over the past several years to provide leaders with some tools to help groups work together while investigating environmental concerns. Many people have contributed to this lesson. Special thanks, appreciation and recognition is given to Dr. Mike Giammatteo, who exposed many of the authors to these techniques and has given permission to reprint selected activities here. This Lesson Plan was developed in February 1973. It is suggested that continuous revision take place by the people who use the ideas.

	Group Size
VII. Identifying Different Grouping Activities (30 minutes) Page 53	Total
A. Concern Cards	1
B. Mini-Market	Total
C. ABC Exercise	3
D. Issue Analysis	
E. Charges - Facts - Denials	
VIII. Developing a Plan of Action for Conducting a Meeting to Insure a Maximum of Group Participation (30 minutes) Page 57	3
Miscellaneous	
5 Square Problem Sheets	
Role Playing Lab Sheet	

Lesson Plan for Identifying Some Techniques of Group Involvement

In the next four hours we will become involved in a variety of activities that will illustrate methods of obtaining a high quality of group participation at meetings; identify some steps necessary to plan for group participation and then develop a plan of action necessary to conduct such a meeting.

Questions and Discussion:

1. List on a 3x5 card two concerns or questions you have about providing for group involvement. Turn your cards in. (Task A)

2. One technique to insure group participation is to break into smaller groups of people. What are some reasons to divide into smaller groups? (Discuss--eg., to hash over points already discussed; when you want work done, make recommendations on a group consensus or something).

3. How many ways can you divide people into small groups? Discuss.

   Examples:
   a. Pairs - limit use. When you want them to discuss something quickly, without distraction, for a brief period of time.

   b. 4-5 people - best for good sharing of ideas, getting consensus, developing recommendations, etc.

   c. 6 or 9 - gets too bulky for good discussion. If the length of time is short, the numbers of people will limit the participation.

I. IDENTIFYING FACTORS THAT AFFECT LEARNING AND COMMUNICATION

A. Curriculum Ball and Colored Glasses Activity (Trip Glasses and Colored Rubber Ball)

- (Ask someone to come up front.)
- Say, "See this red ball, do you think you can catch it?"
- OK. (Toss it to person so he can catch it.)
- "Good - throw it back."
- "Here catch it again, fine, throw it back."
- "Now put on these glasses." (Turn to show audience.)
- "What do you see?"
- "Now I want you to catch this red ball again - do you think you can?"
- "Here it comes nice and easy, just as before."
- "Oops you missed. What's the matter? It's the same red ball."
- "OK - thank you - you can take off the glasses now."
- (Turn to audience) What happened? Why didn't he catch the ball with the glasses on? (Wait for responses from group.)

From: Dr. Mike Giammatteo

- As long as we came from the same background, with similar set of experiences, I was able to send him the curriculum ball, or the environmental message and he was able to receive or catch it.
- But as soon as we changed his set of experiences or how he saw things (the glasses distorted his sight vision - it slowed down his tempo or ability to react fast enough to understand the sender.)
  eg., -same way - common set of experience difference - couldn't catch ball.
  -important to have common experience and to build an understanding together in order to communicate.
- Glasses can represent many things:
  - glasses are symbolic. Child looks at world differently than the world looks at it.
  - different set of experiences.
  - distortion is greater if person comes from different social, racial, or economic background.

B. Tempo Activity — From: Dr. Mike Giammatteo

(Ask person in back of room) - How many seconds will it take for you to get here?) 4 seconds. OK try it. (Count 1, 2, 3, 4, etc.; until person gets to you.)
(Ask another person the same question, and have him come up.)
(Put glasses on person #1, and ask #2) - "How long will it take you to take person #1 back to his (her) seat?" (Ask #1 to remove glasses. How did you feel going back to your seat?) (Discuss how person #1 felt.)
eg., Safe because of touch of other person.
Safe because of his talking in soft tones.
Scared because person #2 walked too fast.
Scared because person #1 hit a chair, etc.

Task B

Working in pairs - discuss and write some examples where you miscommunicated with someone because your tempo or background was different than theirs.

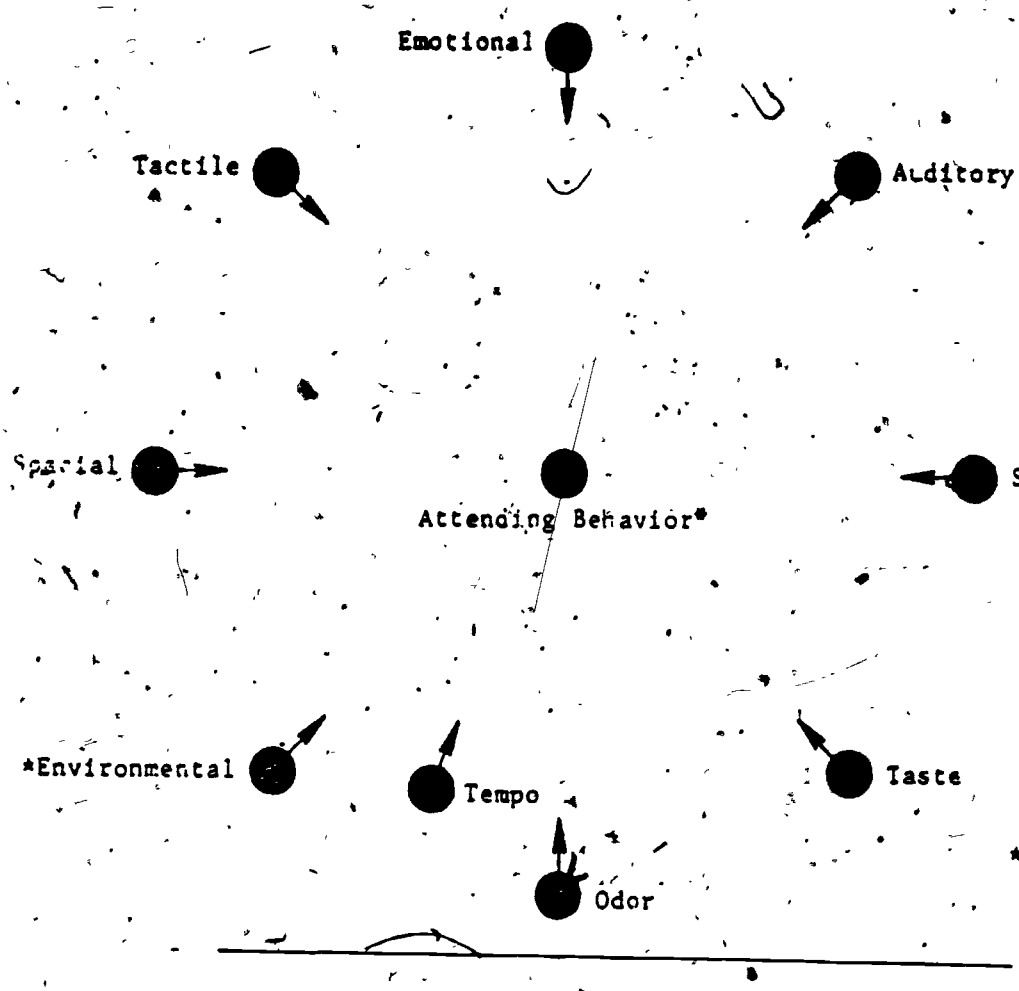
C. Factors that Affect Learning Chart

If we are going to more effectively communicate, we may have to consider many of the factors of learning in this diagram.

a. How many factors on this chart have we been involved in so far? (Group responses.)
b. If one of the learning factors is distorted, we may have to exphasize one or more of the other factors on this chart in order to provide an effective learning experience for the participant. (Example: When tempo and vision were distorted by the glasses, we relied on touch to get the person safely to his chair.)
c. All the forces on this chart must be considered in how a learner receives the experiences and how he uses it.

Task C

FACTORS THAT AFFECT LEARNING



*Where client tries to creat or observe structure from
- future environment
- past
- current

Working in pairs:

1. Circle the factors on this chart that we have been working on so far.
2. Write down some ideas on:
   a. What this chart tells us about learning experiences.
   b. What implications this cha[redacted]s for group involvement.

From: Dr. Mike Giammatteo

STATEMENTS FROM TEACHERS AT CAMP MURRAY 1972 ABOUT WHAT THE CHART, "FACTORS THAT AFFECT LEARNING," TELL US

Learning has to do with and is dependent upon the learners' previous learning experiences, attitude and receptiveness to the present situation, including the surroundings, the working of all senses and the people involved.

Learning is complex in that there are many factors, internal and external, depending upon personal position.

Told a student to make a black and white print for the newspaper and gave the student the negative. When he delivered the print to me it was dried matt and I had assumed that she knew newspaper prints should be dried glossy. Make sure you do not expect the student to know things that he doesn't know. Do not assume. Make sure you are not expecting too much of the student. All the items on the chart could directly affect the performance of the person you are attempting to communicate with.

All learning experiences are different. Many factors contribute to a learning experience.

Many factors contribute to the learning experience. A successful learning experience depends on an integration of all factors involved. We often assume others are operating from the same set of reference as we.

A learning experience is effected by several factors. People bring different backgrounds to a learning experience.

If the persons communicating are not "in tune" on the various things that affect learning, the learning process will be hindered. A person is often so involved in "self" that they fail to observe or investigate the other person's feelings and attitudes.

Behavior is center of learning. Background experiences affect learning and/or inability to learn. Immediate environment can relieve learning problems or increase capability.

We must understand what is blocking ones' learning so that it may be overcome. Outward stimuli and experience affects the learning process. As one becomes more inquisitive, more learning can take place.

The chart indicates that the total person is involved in a learning experience. If one of these areas is lacking, the other areas would have to be depended upon more in order to communicate effectively.

Learning experiences are hampered when various factors are missing such as auditory or vision. If a missing factor is present, other factors may be stressed more to make that learning experience complete. We must be aware of this to correct it.

For most effective learning to take place, you must be tuned in at the same level and proceeding at the same tempo in a compatible environment.

II. IDENTIFYING ROLES PLAYED IN GROUPS. From: Dr. Mike Giammatteo

A. Role Playing Activity:

Roles played by people in the group affect learning too. In order to more effectively work with groups it is important to recognize some of the roles people assume in groups. Some are productive and some are non-productive. Many times people are not aware that they play certain roles.

Task D: 5 minutes (See page 63 for role playing slips.)

1. Get into groups of four. (When in groups of four, do Step 2.)

2. Each of you is being given a slip of paper with the role you are to assume--play it as convincingly as you can. (Cut up copies of the sheet with the roles on it.)

3. The problem:
It is 90° outside--your group wants to go on a picnic--it is 2:30 P.M. One person in your group is to start the plans for the picnic.

Questions and Discussion:

There are many roles, let's look at the four that you just played.

Placator--always soothes over the discussion.
"Everything in due time"
"The sun will shine tomorrow"

Attacker--always attacks ideas presented or will be negative.
"You know the administration will never go along with that"
"People don't care, our group would never do that without pay"

Irrelevant--ideas given that do not relate to the topic (evader).
"Did you see the movie last night?"
"Who's bringing the coffee for the next meeting?"

Sensible--always tries to be as sensible as possible.
"Let's review where we are"
"Why don't we get back to the purpose of the meeting"

1. Some roles might be easier to play than others.
Which were easiest to play? Which were easiest to identify?

2. Discuss with your group some instances where you have seen these behaviors in:
Others Yourself

3. Turn to sheet "Other Roles Played in Groups" and discuss the categories and roles quickly.

Take five minutes in each group and discuss and list some ways to deal with the non-productive behaviors just mentioned. (Task F)

B. Other Roles Played in Groups:

Productive Roles--which people assume to share in solving a problem or making a decision.

1. Initiator--suggests an idea, proposes a solution, says "let's do this."

2. Energizer--prods the group to decision and/or action, stimulates the group, reminds them of the purpose of the group or meeting.

3. Information Seeker--asks for facts, for background information, for clarification, helps group see need for sufficient information for decision making.

4. Orienter--helps group define its position in relation to its goals (Where are we now?), points to departures from goals or objectives, raises questions about the direction the group is moving (Where are we going?).

5. Summarizer--pulls together ideas, suggestions, comments or relevant information to help group understand where it is in its thinking or action process. (Gets us back on the right track.)

6. Encourager--accepts and praises contributions of others, sets atmosphere of friendly acceptance, tries to arrange for everyone to contribute, gently urges group forward. "Let's work together." Aids approval of idea.

7. Harmonizer--points out similarities instead of differences, helps keep group on problems and away from personalities, works toward consensus. "It seems both your ideas are about the same." "That's a good idea but don't you think we ought to consider what Mary just added?"

8. Follower--goes along with the group, passively accepts ideas of others, provides an audience for active members, supports through his presence. "I'll go along with that."

C. Non-Productive Roles--which people assume to stop action. Roles that attempt to satisfy individual needs first.

9. Dominator--tries to get his own way without regard for others; uses flattery, authoritative behavior, sarcasm, etc. Downgrades others' contributions.

D. Non-Productive Roles--which people assume to stop action. Roles that attempt to satisfy individual needs first.

10. Blocker--tries to prevent something from happening, argues, openly rejects ideas, delas in personalities. Interferes with progress by going on tangents, personal experiences on unrelated things, argues unnecessarily on a point, rejects ideas without all facts, may weaken an issue.

11. Special Interest Pleader--tries to gain decision or action favorable to a special group or project regardless of group wishes, uses stereotyped phrases or cliches', appeals to emotion, cites precedents, usually refuses to compromise, etc. States own biases, a special program for his personal gain.

12. Playboy--makes a display of his lack of involvement in the group's efforts and activities, indulges in horseplay, unrelated jokes or comments, "penlicking" or "rubber-band snapping," or other attention-getting behaviors. "Anyone want some gum?" "Have you seen the new TV show?"

Task E

Each group take five minutes and discuss and list some ways to deal with the non-productive roles above.

a.
b.
c.
d.
e.

III. COMMUNICATING IN DIFFERENT WAYS

A. Non-Verbal Cooperation Game

Have audience get into groups of five.
Each person should have an envelope containing pieces for forming squares and these instructions.

Start when the stopwatch is started.

When you begin, the task of the group is to form five (5) squares of equal size. The task is not completed until everyone has before him a perfect square and ALL THE SQUARES ARE OF THE SAME SIZE.

NO MEMBER OF THE TEAM MAY SPEAK.

NO MEMBER MAY ASK FOR A CARD OR IN ANY WAY SIGNAL THAT HE WANTS ONE MEMBERS MAY GIVE CARDS TO ONE ANOTHER.

As soon as you finish, record how much time it took you and replace the cards in the envelope with the same letter as that on the card.

Task F (15 Minutes) (Working in groups of five)

Solve the Broken Squares problem; see pages 58 to 62 for problem squares.

Questions and Discussion:

1. What happened in your group?
2. What kept you from solving the problem?
3. What helped you solve the problem?
4. Take five minutes and discuss with your group some behaviors observed that affected the groups problem solving.

B. Active Listening

Most messages have two parts, one part is the content and the other part is the feeling. It is easy to spot the content but more difficult to identify the feeling. We are going to do an activity to help zero in on these active listening skills.

Task G - Active Listening

Get into groups of two and do the exercise on pages 11-15. Read instructions to whole group.

EXERCISE IN LISTENING

From: Dr. Mike Giammatteo

Instructions:

Divide into pairs. Person A should read statements 1-12 with the intent of expressing the feelings specified in the right-hand column. Person B should listen for the feeling being expressed and write (on the sheet provided) the word or phrase that describes that feeling. The feeling, rather than content should be described. Some of the statements may contain more than one feeling. Each feeling should be noted.

Person B will then read statements 13-24, while Person A listens and writes.

After both A and B have had a chance to listen for feeling they can check on their answers.

Examples:

What the Person Says	What the Person is Feeling
a. I don't know. Nothing seems to go right for me.	a. Discouraged, bothered.
b. I wish I could find someone to talk to about my problem. I just can't figure out what I should do. Oh, darn!	b. Worried, concerned, anxious.
c. Wow, I just won a scholarship to college! Isn't that really great!	c. Elated, excited.

What the Person Says	What the Person is Feeling
1. What! You did all that today?	1. Can't believe it, amazed, unbelieving.
2. Things will work out OK. In fact, I want to get started right away.	2. Still a chance, hopeful, bitter, resentful.
3. I've been married 15 years. I've given him all I've got. I've never shirked my duty, never complained. Now he tells me I haven't grown with him. How unfair can you get!	3. Mad, hateful, bitter, resentful.
4. You know what? My endurance increased every month now since I started those exercises. I'm glad you had that talk with me. Thanks for the help.	4. Thankful, pleased, proud, happy, appreciative, grateful.
5. No question about it. I've heard that sort of thing before. I know I'm right. Those other guys are all wet. We just need a new boss. It's just that simple, no matter what they hand you.	5. Confident, certain, positive.
6. I feel like leaving this place everyday. Why wait around until they fire you on a whim. It's getting so bad you can't even look cross at anyone.	6. Bothered, not wanted, insecure, precarious, tentative.
7. Well, don't you think you would like the same thing done if you were in my shoes? Doesn't everyone feel this way?	7. What would you do, I'm justified, after all I should feel this way, I'm not out-of-line.
8. This place is a second home to me. I feel it fits me like an old shoe.	8. Pleased, comfortable, contented, satisfied.
9. Looking back on what I did, I can't believe it was me. I shouldn't have treated her that way.	9. Sorry, wanting forgiveness, guilty, ashamed.
10. Man, I wouldn't treat an animal the way he treated me. Who does he think he is anyway. I should have hit him right in front of that crowd.	10. Distressed, disturbed, mistreated, offended.
11. I don't care what happens to me anymore, I've really had it. Why go on? It's not worth it.	11. Why fight it, depressed, feel like giving up, discouraged.
12. O.K. I said I was sorry, didn't I? What more do you want me to do? I know I was wrong. You want me to beg?	12. Back away, lay off, I've got the picture.

What the Person Says	What the Person is Feeling
13. Do you mean that? You think I should go back and just tell him to his face? Won't that make him mad at me?	13. Afraid of consequences, hesitant, not sure.
14. I came up the hard way--none of that education stuff. These young punks have it made. Wish I'd had the money to get me a degree. I'd have it made.	14. Fantasy dreams, resentful, envious, feeling of unfairness.
15. I'd like to check with you again on this job you gave me. I've got an answer to it but I don't know. Maybe it's kind of nutty. You know more than I ever will on this kind of thing.	15. Unsure, inadequate, can't trust myself
16. You know, I've been feeling this way for a couple of weeks? It should have gone away by now. What causes this sort of tiredness?	16. Bothered, concerned, worried.
17. I wish he would let me know how I'm doing. He never gives me credit for anything anymore.	17. Uncertainty, feeling of lack of appreciation, need reassurance.
18. I've known of others that tried this and and didn't do much good. Look at the Nelsons. They've gone broke. It sounds good, but I don't think it will work that way.	18. Doubtful, not sure, suspicious.
19. Now that he did it for me, I have to do it for him. But I sure don't feel up to it.	19. In a bind, obligated, in debted.
20. My boy won a football award at school. Neat? Yeh, he's a real boy. Tell me, how do you make your boy study? Maybe we've let our boy get off too easy.	20. Pleased, but concerned; concerned about my son.
21. Tell me something, will you? How much do you think the average man my age makes per month? Of course, my Dad died when I was 18 and that held me back, you know.	21. How do I stack up kind of concerns, Am I on target; worried about my role for my age.
22. Do you definitely need the reports by Monday? I also have that other job as well as the things at home. When is this man going to let up?	22. Overloaded, under pressure, not enough time.
23. Can't we go on to another idea? Why do we have to beat this dead horse another hour?	23. Fed up, sick of the discussion.
24. It's ten o'clock. The meeting was called for 9:30 a.m. I hate to just come in and sit every week waiting for them to show up.	24. Irritated, anxious to begin, resentful.

RESPONSE SHEET I

The other person in your group will read several statements. Write down the feelings expressed in each statement.

		Score
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		
11.		
12.		

Scoring Key

Mark a score of 4 if the answer is matched closely to the one listed. If the answer is similar or partially correct, make a score of 2 beside the item. If you missed completely the feeling, mark in a zero (0) beside the item. A total score between 40 and 48 implies active listening; a score between 28 and 36 implies acceptable listening; scores below would suggest additional practice is needed. In all instances we must continue to maintain or improve our active listening.

RESPONSE SHEET II

The other person in your group will read several statements. Write down the feelings expressed in each statement.

		Score
13.		
14.		
15.		
16.		
17.		
18.		
19.		
20.		
21.		
22.		
23.		
24.		

Scoring Key

Mark a score of 4 if the answer is matched closely to the one listed. If the answer is similar or partially correct, mark a score of 2 beside the item. If you missed completely the feeling, mark in a zero (0) beside the item. A total score between 40 and 48 implies active listening; a score between 28 and 36 implies acceptable listening; scores below would suggest additional practice is needed. In all instances we must continue to maintain or improve our active listening.

C. Asking - Responding

From: Dr. Mike Giammatteo

The way in which we ask or respond to a question makes a difference in how well we are able to communicate. Certain methods of questioning will bring about communication, others will prevent it.

Task H - Asking-Responding

Do the asking and responding exercise on pages 16 to 24.

Read the instructions.

Point out that there are activities for 1 - 2&3 people.

Asking and Responding Exercises:

The way in which we ask or respond to a question makes a difference in how well we are able to communicate. Certain methods of questioning will bring about communication; others will tend to prevent it.

Asking and responding exercises are designed to teach people new ways of asking and responding to questions. By understanding these alternative ways of questioning, one will be able to choose that method which will bring about real communication.

The following exercises are included in this lesson:

- o judgmental responses
- o non-judgmental responses
- o leading questions
- o loaded questions
- o open-ended questions
- o closed questions

Exercise One - Judgmental Responses

Definition: A judgmental response reflects a person's personal opinions and values. When one responds judgmentally, he may--

(1) Show approval of another person's ideas or actions (A)

Example: "That was a great plan. You've got what it takes."

(2) Show disapproval of another person's ideas or actions (D)

Example: "That wasn't very smart of you! Now look at the mess we're in."

(3) Persuade another person to act or think as we wish him to (P)

Example: "How about checking your ideas with me from now on?"

Task 1 - Individual Task

o Write three examples of A (approval), D (disapproval), P (persuasive) types of judgmental responses to the following statement--

"I've decided to move from my apartment."

A _____

A _____

A _____

D _____

D _____

D _____

P _____

P _____

P _____

Task 2 - Work in Groups of Three

o Write three examples of A (approval), D (disapproval), and P (persuasive) types of judgmental responses to the following statement--

"I've changed the date that assignment is due."

A _____

A _____

A _____

D _____

D _____

D _____

P _____

P _____

P _____

Task 3 - Individual Task

o Label responses to the following statements--

1. "I can't cut this job; can I move to another one?"

____"Come on--try it a couple more days."

____"Be glad you have a job and don't complain so much."

____"You're work is just fine. No need to worry."

2. "Don't you like the way I handle this car?"

____"Slow down! I want to live."

____"Sure do. Can you go any faster?"

____"You really ought to watch those speed signs more carefully."

Task 4 - Individual Task

o How would you respond to the following statement? Include A, D, and P responses.

"This assignment is going to be tough to do."

A _____

D _____

P _____

Exercise Two: Non-Judgmental Responses

Definition: A non-judgmental response does not reflect a person's opinions and personal values. When one responds non-judgmentally, he may--

(1) Seek more information (SMI)

Example: "When was the last time he disrupted the class?"

(2) Check his understanding of the person's attitude or emotions by reflecting that person's feelings (RF)

Example: "His behavior is upsetting you?"

(3) Check his understanding of the person's information or ideas by paraphrasing the content (PC)

Example: "In other words, you don't think we ought to do that until we check with your father."

Task 1 - Do in Trios

o Write two examples of SMI (seeking more information), RF (reflection of feeling), and PC (paraphrasing content) in response to the two following questions.

Practice Sample:

"He is always picking on me!"

SMI: "Can you tell me other instances where this happened?"
RF: "You're feeling unhappy about this?"
PC: "You mean he gives you a bad time?"

1. "You're not going to let her do that, are you?"

SMI _____

SMI _____

RF _____

RF _____

PC _____

PC _____

2. "Isn't that guy impossible to work with?"

SMI _____

SMI _____

RF _____

RF _____

PC _____

PC _____

Task 2 - Individual Task

o Label responses to the following statements as SMI, RF, PC--

1. "This is a tough bunch of kids I have to work with."

____"They get pretty rowdy at times, huh?"

____"How long have you been working with them?"

____"You're worried you won't be able to handle them?".

2. "I get nervous each time he comes in here."

____"You're concerned that you aren't doing the task right?"

____"He makes you jittery?"

____"How often does he barge in like that?"

3. "I feel silly coming to you with this problem."

____"What is the problem?"

____"It embarrasses you to talk about that?"

____"You want to talk to me about your problem?"

Task 3

o How would you respond to the following statement? Write SMI, RF, or PC responses.

"I get so tired at times."

SMI _____

RF _____

PC _____

Exercise Three: Leading and Loaded Questions

Definition of a leading question (L): When a person asks a leading question, he suggests how he wants the other person to answer. In this sense, leading questions are judgmental because the asker reveals his own feelings. At the same time, the respondee's answer may not reflect how he really feels. The asker cannot trust the information obtained for he has already suggested what would be acceptable answers.

Examples of leading questions:

- "It would be a good idea to keep our instruments in order, wouldn't it?"

This question suggests the following answer; "Yes, it would be a good idea." Maybe the person would rather say: "No, I think it is a terrible idea."

Other examples--

- "You agree with Dr. Smith who has ten years' experience in this field, don't you?"

- "Of course, the wise thing to do is talk to her, isn't it?"

Definition of a loaded question (LQ): A loaded question traps a person. Because of the construction of the question, the respondee is caught no matter how he answers.

Examples of loaded questions:

"Have you stopped getting your instruments mixed-up?"

"Yes, I have (stopped getting my instruments mixed-up)"

"No, I haven't (stopped getting my instruments mixed-up)"

Whether or not the respondee has stopped getting his instruments mixed-up, he must admit that, at some time, his instruments were mixed-up.

And--

"When are you going to stop being so stubborn?"

No matter how the person answers, he is admitting that he is stubborn.

Leading and loaded questions can be used in a positive as well as in a negative manner. They can be used in situations where a person wants to place restrictions on the other person's verbal or behavioral response.

An example of a positive use of a leading question would be a mother wishing to elicit from her child the response that will keep the child safe.

Mother: "The pot on the stove is hot and will burn your hand if you touch it. So you wouldn't touch it, will you?"

An example of a positive use of a loaded question would be in using it for confrontation purposes such as a doctor speaking to his patient.

Doctor: "When are you going to stop smoking?"

Task 1 - Triad Task

o List three examples of both leading and loaded questions which you should avoid in your work situation:

L _____

L _____

L _____

LO _____

LO _____

LO _____

Task 2 - Group Task

o Give examples of situations where you might use the following questions to avoid leading and loaded questions:

"Are you glad you act that way?"
"Should everyone believe that?"
"Why do you think so?"
"Is this what you really think?"
"What is the source of your idea?"
"In what ways is that a good idea?"
"Have you thought of alternatives?"

Task 3 - Individual Task

Label responses to the following questions as L(Leading) or LO (Loaded):

____1. "Have you stopped getting your assignments mixed-up?"

____2. "What's wrong now?"

____3. "You see what I mean, don't you?"

____4. "How about returning that book you borrowed last year?"

____5. "He sure was mad, wasn't he?"

____6. "When are you going to clean that messy room?"

Task 4 - Individual Task

o Write two examples of leading and loaded questions:

L _____

L _____

LO _____

LO _____

Exercise Four: Open-ended and Closed Questions/Statements

Definition: Questions which restrict the number of possible answers are closed questions. The more a question allows the other person to decide what is important or relevant to him, the more open the question. An open-ended question allows a person a choice in how he wishes to answer; a closed question limits those choices.

1. Example: "I hate to see all of you suffer because just one person messed up."

   Who goofed up? (C)
   What happened? (O)

2. Example: Two children are fighting and the mother interrupts:

   "Scotty, why are you always hitting your sister?" (C)
   "What's the problem, kids?" (O)

3. Example: Father and son talking about the future:

   "You are going to be a doctor just like daddy, aren't you?" (C)
   "Have you thought about what you might like to be when you grow up?" (O)

Task 1 - Individual Task

Label responses to the following questions with a C if it is a closed response and with an O if it is open.

____1. "What would you like to do this evening?"
____ "How about going to that new restaurant tonight?"

____2. "Are you coming home before 10:00?"
____ "When are you coming home?"

____3. "Will you have the work done by four o'clock?"
____ "When can you finish that report?"

____4. "How would you do it?"
____ "I think we ought to do it this way, huh?"

Task 2 - Triad Task

o Write examples of closed and open questions in response to the following:

1. "She doesn't think I ought to dress this way."

(O) _____

_____

_____

(C) _____

_____

_____

2. "They close the place too early."

(O) _____

_____

_____

(C) _____

_____

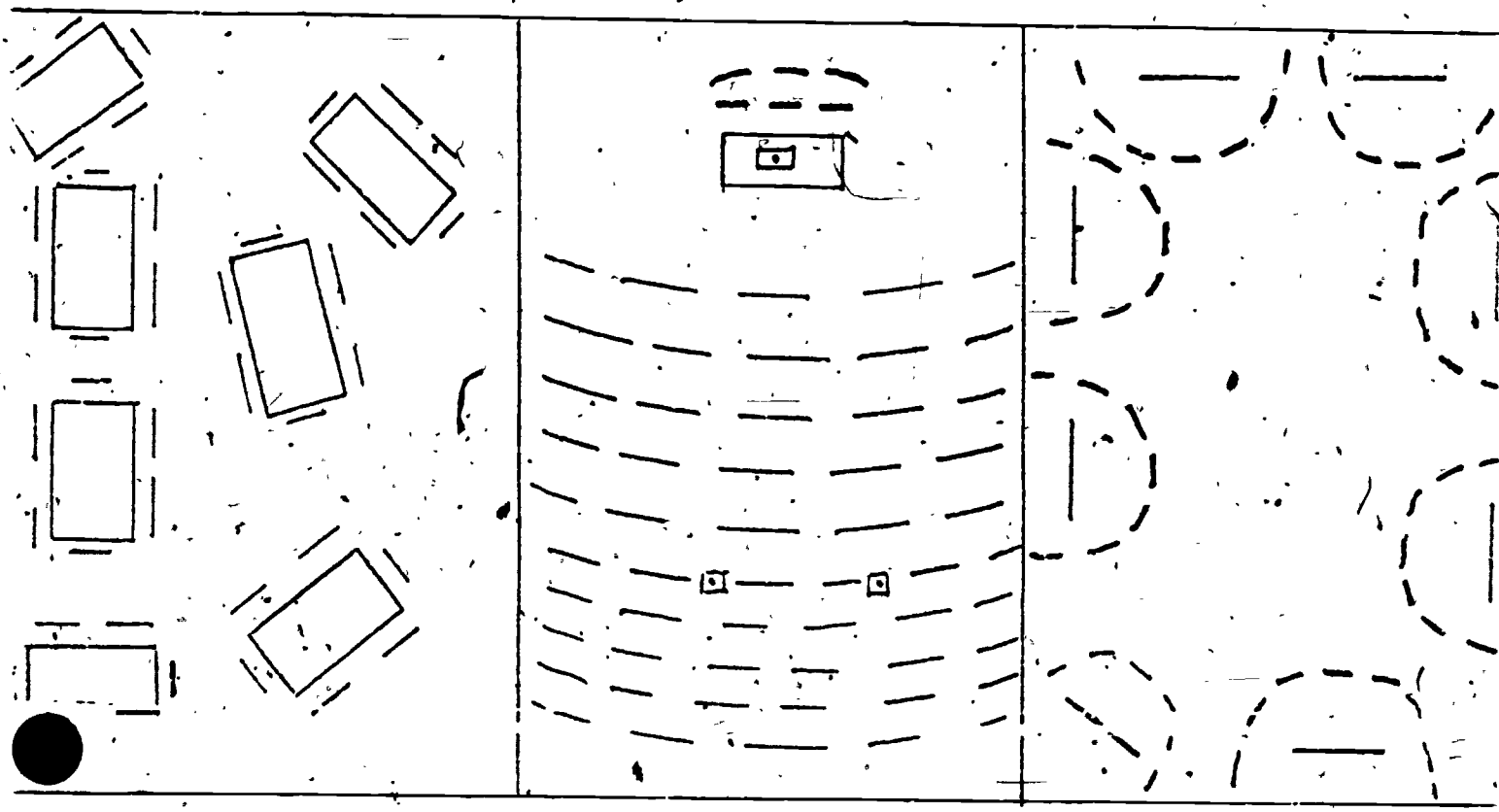
_____

Summary: Whether or not a group is able to achieve its goals depends to a great extent on whether or not its members are able to communicate well with each other. At the same time, however, the group must be able to communicate its goals to members outside the group.

No one type of the six questioning strategies discussed above is appropriate in all cases. The appropriateness, of course, depends upon the situation. But if our goal is a greater exchange of information, we can best achieve it by using neutral, non-judgmental methods for discussion. These neutral methods will bring about open and effective communication.

IV. PLANNING FOR GROUP ARRANGEMENTS

Task 1 - Answer the questions below:



Which room arrangement:

suggests 'we talk, you listen' or 'you talk, we listen'

suggests limited 2-way communication (audience responses directed at one person)

will allow for maximum participation by the most number of people for the most time. (where people talk to each other)

will allow a maximum quantity of information to be presented in a fairly short time

will allow an 'axe-grinder' the largest audience.

will allow input from all participants on an equal level

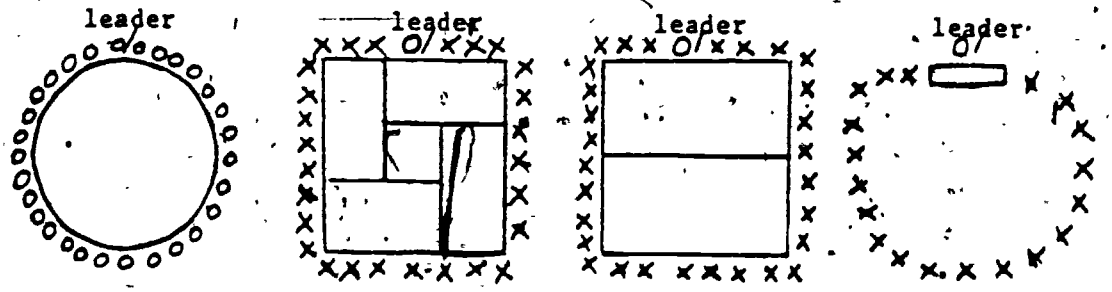
What does this tell us about meeting room arrangements?

SOME IDEAS FOR PROMOTING INTERACTION IN GROUPS

FROM: Dr. Mike Giammatteo

1. Arrange group in circle, so each person can see every other person.

2. Provide table space, if convenient, for leader and entire group, as follows:



3. Let all stay seated during discussion, including leader. Keep it informal.

4. Start by making everybody comfortable. Check ventilation and lighting.

5. See that everybody knows everybody else. At first gathering go around the circle, each introducing himself. As a newcomer joins the group later, introduce yourself to him and him to the group.

6. Learn names of all as soon as you can.

7. Have blackboard, chalk and eraser ready for use in case of need. Appoint a "blackboard secretary" if the subject matter and occasion make it desirable.

8. Start on time, and close at prearranged time.

9. In opening, emphasize: Everyone is to take part. If one single member's view fails to get out in the open, insofar the discussion falls short.

10. Toward this, emphasize: No speeches by leader or group member. No monopoly. After this opening statement, limit individual contributions to a minute or so.

Carrying on

1. Make your own preparation for the discussion. Think the question through in advance. Aim to establish connections between ideas of background materials, and experience of ideas of group members.

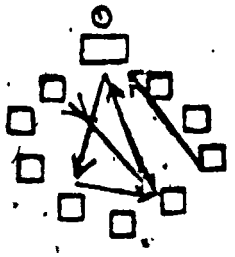
2. Aim at outset to get a sharply defined question before the group. Have three or four alternates put on board if you think this will help, "Which do you want to start with?" "Is this question clear?"

3. In general, don't put questions to particular group members, unless you see that an idea is trying to find words there anyway: "Mrs. Brown, you were about to say something." Otherwise, "Let's have some discussion of this question. . . ." "What do some of the rest of you think about this?" "We've been hearing from the men. Now how do you women feel about this?" "What's been the experience of you folks up in the northern part of the State in this connection?" Etc.

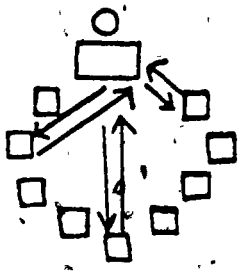
4. Interrupt the "speechmaker" as tactfully as possible. "While we're on this point, let's hear from some of the others. Can we save your other point until later?"

5. Keep discussion on the track, keep it always directed, but let the group lay its own track to a large extent. Don't groove it narrowly yourself. Try to have it as follows.

This way:



Not this way:



6. Remember: The leader's opinion doesn't count in the discussion. Keep your own view out of it. Your job is to get the ideas of others out for an airing.

7. If you see that some important angle is being neglected, point it out. "Bill Jones was telling me last week that he thinks. . .What do you think of that?"

8. Keep the spirits high. Encourage ease, informality, good humor. Let everybody have a good time. Foster friendly disagreement. Listen with respect and appreciation to all ideas, but stress what is important, and turn discussion away from what is not.

9. Take time every 10 minutes or so to draw the loose ends together. "Let's see where we've been going." Be as fair and accurate in summary as possible. Close discussion with summary--your own or the secretary's.

10. Call attention to unanswered questions for future study or for reference back to speakers. Nourish a desire in group members for continuing study and discussion through skillful closing summary.

Task J - Do in groups of 3-4

List other factors important to consider in planning for group involvement.

What are some factors that each group came up with? (List, group and label on board.)

STAGES OF GROUP GROWTH

From: Dr. Mike Giammatteo

Read this and then in groups of 3 do Task I on next page.

Every group has to spend time and energy learning how to work together. Usually some feelings develop between members while they are learning. It takes time for group members, each different, to learn how each can fit into the group and contribute best. So things often seem "all mixed up," and group members may quite naturally become disturbed and discouraged--even aggravated at each other.

It helps to know that these are natural "growing pains" of democratic groups, that these feelings between members tend to follow a predictable cycle or sequence, and that in most cases the group will soon become productive and efficient as people work to solve group problems..

Let's take a look at the stages in this developmental process.

1. "Groping": When the group is first finding out how to plan and work together they may not all agree. They don't know and understand each other well enough to really trust the group, and they still have to determine each others' skills, knowledges, situation and attitudes. So they often feel uncomfortable and "lost."

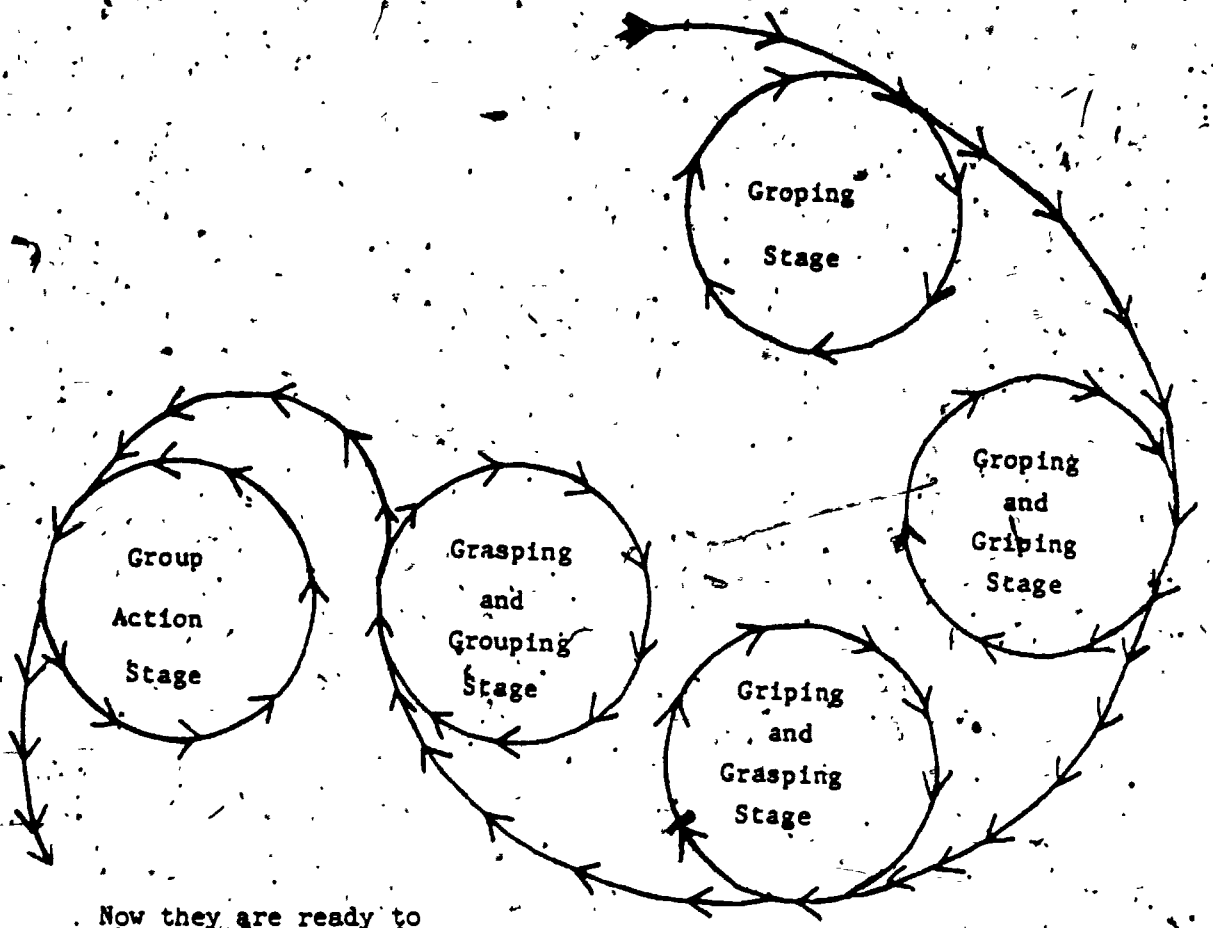
2. "Griping": The group gets discouraged when they can't seem to work together, when there isn't much progress, and their attempts are frustrated. They say wrong things to others, play negative roles and block group action because they are uncomfortable. This is the place for more "self-other" understanding, to remember that they are all different but they all want to do a good job and be liked by others. Maybe they can learn to understand why others are griping, and learn to give themselves time to work things out.

3. "Grasping": Now ideas and suggestions are beginning to fit. The group begins to agree on questions, and can start to see some direction to group activity. Everyone begins to feel more comfortable and now they are getting somewhere.

4. "Grouping": They are really getting to know each other, and can understand and enjoy how each one works and fits into the tasks to be done. Group tasks, building and maintenance roles come into play, and a surge of enthusiasm spreads through the group.

5. "Group Action": Now the group is in full swing, with members playing constructive roles, leadership shared, everyone participating. It was difficult at first, but worth it to learn to work well together. They have shared in making plans and decisions, have learned together, and feel this is a good group with which to work. They are proud of making their group more democratic.

On the following page is a picture of these feeling stages people go through together as they work at problems they all want to solve.



Now they are ready to tackle other jobs. It can be expected they will still go through some of these early stages, but each time it can be less disturbing, more effective.

So it is important to recognize how they feel about others in the group, to know that these feelings are natural whenever they really tackle important jobs, to realize that the group can move ahead toward better-feeling relations between members. As they get to know each other better, this group gradually becomes their group because they have shared plans and work, and have tried to practice ways of behaving which are cooperative, considerate, friendly--democratic.

TASK K

In small groups of 3, list examples of the different stages of group growth we have experienced during this week.

List the factors that might affect different stages of group growth.

V. IDENTIFYING THE ROLE OF THE FACILITATOR AND RECORDER

A facilitator is concerned that everybody feels included and accepted and he attempts to remain neutral on the content. The facilitator is trying to promote group responses, help the group generate their own data, develop a group value system, etc. He is not there to impose his interpretations, value system or answers on the group.

He should:

1. Suggest procedures for meeting and then get suggestions for change, commitment and acceptance from group to adhere to those procedures.
2. Keep the meeting on the topic.
3. Clarify and accept communication.
4. Accept feelings as valid data.
5. State a problem in a constructive way.
6. Summarize and clarify direction.

Task L

After reading the next seven pages, develop a list of criteria with two others to use in identifying and selecting a facilitator.

THE FACILITATOR ROLE
Topic Paper From Synergy

We have called the meeting leader a "Facilitator" to distinguish him from the typical "Chairman."

The fundamental difference between a Chairman and a Facilitator is the directiveness of the Chairman role. The Chairman makes rulings, determines procedures, rules people out of order, etc. The Facilitator proposes, suggests, invites and then consults with the participants to generate a consensus.

In general the Facilitator is more concerned that everybody feels included and accepted and attempts to remain quite neutral on the content. One way of viewing the Facilitator Role is that the Facilitator is trying to provide just enough structure so that the Relationship Level does not interfere with the Content Level.

Below is a list of things a Facilitator has to be concerned about as well as ways he can handle each situation:

1. Keep the Meeting Focused on the Topic:

   Point out that the discussion has drifted. Usually the meeting will quickly return to the topic.

   Re-state the original topic under discussion.

   Example: "My understanding is that we were discussing..."

2. Clarify and Accept Communication:

   Summarize the contribution of participants. In particular summarize the contributions of participants who have not been actively involved. "Your feeling is that..."

   Relate one participant's idea to another. "If I understand it correctly, your idea would add to Mr. Smith's by..."

   Accept incomplete ideas. "Could you develop that idea a little more."

   Point out when a team member's contribution is cut off and invite him to complete it. "I'm afraid that we may have cut Mr. Jones off. Did you have more you wanted to contribute, Mr. Jones?"

3. Accept Feelings as Valid Data:

Summarize feelings as well as content. "You feel angry when..."

4. State a Problem in a Constructive Way so That the Meeting Can Work on it.

State the problem in such a way that it doesn't sound like blame-fixing or an accusation of the participants.

Send problems not solutions.

Help clarify the areas of decision-making. "As I understand it, the Wilderness Act does not allow for development of recreation areas, however, it is open to us to recommend the classification of this land."

5. Suggest a Procedure or Problem-Solving Approach:

Point out when it may be useful to move on to the next problem.

"I'm wondering if we're ready to move on to..."

Suggest a procedure.

"I'd like to propose that we might break into small discussion groups..."

6. Summarize and Clarify Direction:

Summarize your understanding of what the meeting has accomplished and indicate what the next steps will be.

7. In a Small Meeting the Facilitator May Also Play the Recorder Role.

See Topic Paper on Recorder Role.

BEHAVIOR THE FACILITATOR SHOULD AVOID:

In addition to the behavior listed above which an effective facilitator will employ, there are also certain behaviors which the Facilitator should avoid because they will make his role impractical. The Facilitator will not be effective if he does not remain neutral, becomes a major participant in the content, manipulates the group through the use of his role, or uses his role to assert his own ideas.

Specifically the Facilitator should avoid:

1. Judging or criticizing the ideas or values of others.

2. Projecting his own ideas and using his role to argue for them. If you want to add your own ideas, make some clear identification that you are not making the comment as Facilitator -- "I'd like to take my Facilitator hat off for a minute and comment." If you get involved, though, it would be better to ask someone else to assume the Facilitator Role so that you are free to participate.

3. Making procedural decisions for the meeting without consulting participants.

4. Lengthy comments.

THE RECORDER ROLE
Topic Paper From Synergy

The Recorder Role is a role which may be played by the Facilitator in a small meeting, but in a larger meeting should be handled by another individual.

The Recorder's Role is to record the contributions of the participants in a highly visible manner such as on a flip-chart or large sheet of butcher paper (a blackboard is ok if someone is keeping a permanent record from it).

Each participant's ideas and feelings are summarized so the whole group can see the summary. The Recorder attempts to record the statement as intended by the participant, but the participant may ask the Recorder to modify if needed.

In addition the Recorder should also record agenda items or agreed upon procedures.

The Recorder Role plays several important functions:

1. It accepts everyone's contributions by recording them.

2. It keeps the contributions very visible and helps people keep track of what has of hasn't been suggested.

3. It serves as a visibly agreed upon record of the meeting.

Like the Facilitator Role, the Recorder is a servant of the group. The Recorder tries carefully to record what he is hearing from the participants and avoids modifying what he writes to suit his own thinking. He must also be certain that if he is recording ideas he does not record only those ideas which he thinks to be productive. He must record them all.

SOME CONCEPTS OF LEADERSHIP

From: Dr. M[illegible]e Giammatteo

I. WHAT IS LEADERSHIP?

A. MODERN DEFINITION

In basic terms, leadership is the activity of helping others work toward common goals or purposes.

Today, the expert in leadership is the one who best knows how to release the creative talents of those with whom he works. In earlier years, the expert in leadership was considered to be the one who best knew the answers. Now, terminology has changed from "directing and controlling" to "involving and motivating."

Leadership may be regarded as a series of functions that: (1) builds and maintains the group, (2) gets the job done, (3) helps the group feel comfortable and at ease (looking after physical setting, acquaintanceship, etc.), (4) helps to set and clearly define objectives, and (5) cooperatively working toward these objectives.

B. LEADERSHIP MYTHS

[illegible]earlier years it was assumed that leaders possessed certain special traits or characteristics. Many studies were made in an effort to correlate the leadership capacity or potential of an individual with these personal attributes. While some definable personal characteristics have been linked to leaders in certain situations, these studies haven't been successful in providing a formula for leadership selection. The modern concept is that leadership is functional or "job centered." We should ask then, "what does an effective agency do," rather than, "what kind of agency will be a good leader."

We have often heard the statement, "He is a natural-born leader." We know now that a leader in one situation may have very little leadership ability in another. A guide on a mountain climbing expedition might not be a very effective school board chairman.

C. THE ART OF SCIENCE OF LEADERSHIP

The ability to work effectively with groups in a leadership role can be learned through conscientious effort, study and practice.

It may truthfully be said that leadership is both an art and a science. The scientific principles are learnable. Therefore, any of us may do a better job of leadership if we understand and conscientiously practice some of these principles.

The art of leadership is the way in which we apply leadership principles. We know that there is variation among us in the manner in which we carry on any activity. This is apparent in such every day activities as playing a musical instrument, going to school, cooking a meal or even fishing.

In each of these activities as in leadership, learning and practicing certain principles will help but, of course, people vary in the degree to which they approach application. Students of human relationships have identified many functions or skills that are based on sound leadership principles.

D: SKILLS OF LEADERSHIP

The following are some of these skills that are important to learn and to practice.

1. Skill of personal behavior. The effective agency:

   a. Is sensitive to feelings of the group.

   b. Identifies self with the needs of the group.

   c. Learns to listen attentively.

   d. Refrains from criticizing or ridiculing members' suggestions.

   e. Helps each member feel important and needed.

   f. Should not argue.

2. Skill of communication. The effective agency:

   a. Makes sure that everyone understands not only what is needed but why it is needed.

   b. Makes good communication with his group a routine part of his job.

3. Skills in equality. The effective agency recognizes that:

   a. Everyone is important. Everyone needs recognition.

   b. Leadership is to be shared and is not a monopoly.

   c. A leader grows when leadership functions are dispersed.

4. Skill of organization. The effective agency helps the group:

   a. Develop long-range and short-range objectives.

   b. Break big problems into small ones.

   c. Share opportunities and responsibilities.

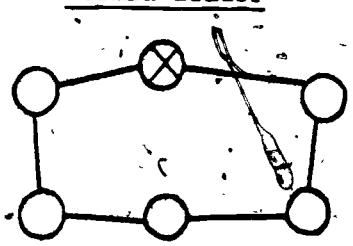
   d. Plan, act, followup and evaluate.

SHARED LEADERSHIP

From: Dr. Mike Giammatteo

A. The appointed or "duly elected" leaders such as the chairman, president, boss or manager may exhibit autocratic, democratic or "laissez-faire" leadership. Some appointed or elected leaders feel that position of leadership entitles them to exhibit autocratic leadership--others strive toward democratic leadership but find that it often takes longer to get things done.

B. The shared leadership role. This relates to a person whose behavior in the group helps keep the group happy and get the task done.

Group Leader	Formal Leader	Group Leader
Is creative Has good ideas Open minded Facilitates Analyzes		Supports Relieves tension "Good fellow" Dependable-liked
Helps group work on task		Helps meet needs of group

All members of a group should at some time or another provide this type of leadership.

C. Advantages of shared leadership. Shared leadership is the ideal and it can only develop in a democratic leadership situation. Some of the values of shared leadership are:

1. Pools the skills and abilities of the entire group.
2. Promotes a spirit of unity--"my group" feeling.
3. Each member feels a greater responsibility for group maintenance and task.
4. Members are more interested--have a "stake" in goals and objectives that they help establish.
5. Contributes to the growth and development of both members and leaders.
6. Promotes a greater feeling of satisfaction as each group member shares in common achievements.

D. The shared leadership concept requires:

1. Clearly defined goals and objectives as identified and agreed on by the group.
2. Freedom of group members from fear of criticism or ridicule.
3. A warm friendly atmosphere--"permissive as opposed to directive."
4. A setting where group members are socially at ease and physically comfortable.

SOME IDEAS FOR DEALING WITH GROUP CONFLICT

From: Dr. Mike Giammatteo

When there is "conflict" in a group--that is, a lack of democratic behavior between two or more group members--you will usually find it is "somebody" rather than an "idea" that is under attack.

In other words, people tend to say, "I don't agree with YOU," or "I think YOU are wrong," instead of "I don't agree with your IDEA," or "I think the IDEA you have placed before the group lacks merit."

Here are some things to keep in mind when dealing with a conflict situation.

1. Understand yourself and the other person(s).

   a. Interpret your feelings--don't explode them.

   b. Try to understand the other's situation, his point of view.

   c. Try to get a "third-person" viewpoint, to see the situation objectively.

2. Keep improving your skill and power to express your position and feeling.

   a. People know and understand you by what you do and say, not by what you "mean."

   b. Watch what words you use. Do these words mean the same thing to both or all of you? An agrument is often no more than a misunderstanding.

   c. Work to communicate your real self and yet keep up the lines of communication.

   d. Do not destructively attack the "self-concept" of the other person.

3. Get at the causes of the conflict, don't just look at the symptoms.

4. Be unto each other as persons--respect each other and trust each other.

A Partial Checklist of Tips for Facilitators

1. Listen to what your audience says.
2. Accept what your audience says.
3. Ask for reasons why.
4. Don't rephrase in your own words.
5. Plan sequences of questions.
6. Ask questions that allow greater responses.
7. Refocus on original question if discussion gets off subject and on a tangent.
8. Don't throw in your own opinions.
9. Don't ask multiple questions.
10. Allow time for audience response.
11. Ask lifting questions.
12. Don't restrict responses.
13. Encourage inter-person reactions.

Which of the above take more skill?

What changes need to be made in the room or audience to allow them to take place?

VI. IDENTIFYING DISCUSSION SKILLS

Many times we are at a loss to know how to keep a meeting moving or a discussion alive. By developing and using certain discussion skills we can raise the level of the discussion and increase the interaction among participants.

This section includes some discussion skills designed to help you deal more effectively with the comments and responses you get from the questions you ask.

TABLE OF CONTENTS

This section is based on the philosophy developed in the course entitled "Higher Learning Thinking Abilities," developed at the Northwest Educational Research Laboratory. Special appreciation goes to Mr. Dick Phillips, Milwaukie, Oregon for his consultation and training in the development of Identifying Discussion Skills.

A. DISCUSSION SKILLS THAT MIGHT AFFECT PEOPLE'S FEELINGS, ATTITUDES, AND PARTICIPATION

Response to the person's feelings

The social-emotional climate of a group can facilitate or impede discussion. People tend to be cautious about exposing their ideas to value judgments of other people. The kind of climate that permeates a group can be judged on the basis of the accepting or rejecting behaviors exhibited within.

Each item on the list below is a possible response to a person who says,

"Well, I still think you should put water faucets with climate."

Rank order the responses from least to most accepting.

1. T Look at the other items under climate. Do water faucets fit?
2. T Let's put it in this group. We can always change it if you want to.
3. T There seems to be a difference of opinion. What do the rest of you think?
4. T Can you change the label so water faucets would fit?
5. T I think most of the group doesn't agree with you.
6. T It really doesn't go with the other items.
7. T All right.
8. T Let's hold that idea for a minute and see if we can finish the other groups.
9. T Let's listen again to his reason.

Here are some discussion skills important in promoting group participation.

1. Acceptance

A substantial portion of a facilitators replies are categorized as "response to the audience." Granted that all remarks are addressed to someone; but sometimes special attention must be directed to building a persons concept of himself as a worthwhile person. In the thinking tasks some specific strategies are suggested to establish a climate favorable to an open exchange of ideas without fear of rejection.

Chief among these are accepting behaviors. When a primary child, for example, interjects an announcement about his little brown dog, the teacher accepts his offering in one of a variety of ways and refocuses the discussion so the rest of the class doesn't get sidetracked. When a student does not stick to the question or is responding to an earlier question now that it is his turn, the teacher may skillfully tie his comment into the mainstream of the discussion or ask him to hold on to his idea, or simply acknowledge his contribution.

Identify the accepting response to the student in each pair:

1. a. We are not talking about differences.
   b. You said the land was different. All right.
2. a. I'll write that down.
   b. Which gold rush are we talking about?
3. a. How does this compare with last time?
   b. That's an interesting idea.

NOTE: With practice even young children learn to speak to the point and demonstrate their awareness of holding to the focus through explanatory asides that precede their remarks, e.g.,
"This isn't what you asked, but I want to say---"
"Getting back to what Marcy said---"

Accept all responses in a non-judgmental manner. If you have set the groundwork for the freedom of group participation and discussion, it will be easy to accept all responses in a similar fashion.

Other ideas: O.K., Bill, any other ideas?; Thank you, Sue, any others? etc.;
Other comments, suggestions, or ideas:

_____

_____

2. Supporting

In any discussion the facilitator often responds to a person by supporting him. As a face-saver the teacher, for example, offers support to those students who have problems of entry into the mainstream of room interaction:

The child who is suddenly unable to respond when called on.
The shy child who offers irrelevant information on his first attempt.
The unpopular child whose every comment is attacked by someone.
The child whose ideas are always just given by the last speaker.
Any child who needs a helping hand.

Select the supporting responses in each pair of the following:

1. a. Shall I come back to you later?
   b. Who else has an idea about this?
2. a. I don't understand you, John.
   b. Let's give John a chance to tell it his way.
3. a. Does someone have another idea?
   b. I'm not sure about that. Maybe we could look it up later.
4. a. You can say it again if you want to. Maybe some of the boys and girls didn't hear Mary when she said it.
   b. Do we have something like that up here, already?

In a supportive role, the most difficult aspect for the facilitator is handling errors. When a person makes an error of specific fact, the facilitator in his role of clarifier may ask another question to allow the person to correct the error by himself. Another way, if disagreement is encouraged routinely, is asking the group for a different point of view.

In each case the teacher refrains from direct correction to avoid drying up participation. When students become apprehensive about the reception of their thoughts, they will offer only the answers they consider pleasing to the teacher.

If a person's response, by its error or irrelevancy, shocks the questioner, it is wise to remember that anyone's head holds numerous "false" ideas, economic, political, historical, etc. They become apparent only when expressed verbally. If a person never opened his mouth, no one would know what "rights and wrongs" he has collected over the years. Getting the "wrongs" out into the open is one advantage of discussions. For example, if a large segment of the group displays serious misunderstandings about climate, the facilitator can plan learning activities to rectify the mistakes. Just identifying a persons response as wrong does not correct it for that person or for any other person. Corrections that come from a person's own experiences are much more effective.

One of the experiences acceptable to most people is friendly disagreement with one's peers. Summoning defenses for different points of view is beneficial to thought development also. Facilitators skilled in discussion, encourage active participation through this device of seeking differences of opinion and inviting everyone to express his views. Disagreement is particularly fruitful if there is no pressure for closure, no voting, no concern when an impasse is reached. A side benefit accrues to people who learn early that in some areas there are no easy answers, no one "right" conclusion, only differences in the way people process the available data.

Other ideas:

"Take a minute to think."
"Go ahead--express it in any way that you can."
Avoid editorializing--
(Nonverbal support) Wait, don't rush the response.

Other comments, suggestions, or ideas:

3. Rewards

This is a subtle area, but certain guidelines can be followed.

a) Don't get in the pitfall of rewarding one person and not another. Don't play favorites.
b) The "tone of expression" is very important. Avoid the "over-reward"--the overly explicit, overly-generalized reward.

"Excellent, Bill! Wonderful, tremendous work, very good!"
"Marvelous thinking, Jim!"

This type of reward has the effect of binding, rather than freeing the discussion. Many persons will be reluctant to respond for fear they won't receive it.

c) The most effective rewards are an implied acceptance of the person and his ideas.
d) Incorrect responses need to be handled in a manner which accepts the person, but rejects the content.

"Thank you Johnny, what type of information would we need to check out your theory?"

Rewards relate back to the supporting discussion skill.
Other comments, suggestions, or ideas:

4. Encouraging

Encouraging participation is another form of response to a person's feelings. Involvement assists a person to feel he is an adequate, worthwhile member of the group. If a person is reluctant to enter the fray, he can be invited to disagree, recap, summarize, or just jump in and contribute.

Choose the response that seems most likely to be encouragement rather than any of the other types of responses.

1. a. Has everyone had a chance to say what he thinks?
   b. Let's go on to the next column.
2. a. Does someone want to disagree?
   b. All right.
3. a. Why does this information help us?
   b. Do you want to run through that information again, sort of pull it together for us before we go on?

Other comments, suggestions, or ideas:

5. Tone of Expression

The emotional overtone of a question or response to a question can either encourage or inhibit participation.

L - "What industries would we find in the Yukon?"
P - "Trapping."
L - "All right. What else?"
P - "Silver mining."
L - "Very good, Johnny!" ("You guessed what was on my mind.")

Such an exchange is likely to inhibit people who do not feel that they are very good at guessing what is on the leader's mind.
Other comments, suggestions, or ideas:

6. Restricting Words

Often we inadvertently use words which, in themselves, restrict or distort the openness of the discussion.

"What important things did the film show us?"
(Now the person has to guess what you think is important)

Get in the habit of writing down the major questions ahead of time. This does two things--you put the question on paper and you can analyze it ahead of time to weed out restricting words. If you have the question on paper in front of you there is less chance to "ad lib" and throw in extra words you hadn't planned on.

Other comments, suggestions, or ideas:

_____

_____

7. Polly Parrot

POLLY PARROTING is a common pitfall of many people leading group discussion. It detracts immensely from the effectiveness of the leader and the discussion.

This is when the leader repeats everything each person in the audience says.

L - What did ycu just see?
P - A hawk.
L - A hawk, did anyone see anything else?
P - A dove.
L - A dove, did anyone see anything else?
P - A deer.
L - A deer, anything else?
Etc.

Implications of Polly Parroting

a) teacher - student - teacher - student relationship.
b) no one has to listen to anyone but the teacher because everyone knows the teacher will repeat everything.
c) no one has to speak out loud so everyone can hear.
d) restricts group interaction.
e) we become a group of mumblers.

Some ideas on how to correct being a Polly Parrot

1. Recognize if you are one. Many people don't realize they polly parrot until someone tells them.
2. A simple technique to overcome polly parroting is to ask the person to say it again, so everyone can hear. Refuse to repeat the response. Ask them to repeat it three times if necessary.
3. Accept the response and do not say anything. By your non-verbal behavior, indicate you're open for additional comments.
4. Say "thank you, any other comments?"
5. But what if someone says something in a teeny voice nobody can hear? Ask them to repeat what was said.
6. And what if they say it in the teeny voice again? Ask people on the other side of the room (or farthest away) if they were able to hear what was said.

After all, the group is supposed to be talking to each other, not the discussion leader. By throwing the responsibility back to the group members, you'll keep the discussion from being leader-entered.

Other comments, suggestions, or ideas:

3. Leading Questions

A leading or loaded question suggests how the leader wants the group to answer. This type of question reveals the leader's own feelings and value system. The leader cannot trust the validity of the information because he has already suggested what answers he wants.

"It would be a good idea to pave that street, wouldn't it?"
"Of course the best way to do it is to walk to work, right?"

Leading questions restrict open discussion because the audience has to decide what to answer to gain acceptance from the leader.

Other comments, suggestions, or ideas:

4. Loaded Questions.

A loaded question traps a person. The audience is caught no matter how he answers.

"Have you stopped throwing your garbage?"
(Yes I have or No I haven't---He had to admit that at least once he threw away garbage)
"When are you going to stop being so stubborn?"
(This also restircts open discussion because nobody wants to be put on the spot)

Other comments, suggestions, or ideas:

B. DISCUSSION SKILLS THAT MIGHT AFFECT THE COMPLETENESS AND RELEVANCY OF THE SUBJECT BEING DISCUSSED

1. Multiple Questions

In our enthusiasm to emphasize the importance of a question, we often elaborate with additional questions, and end up by switching the focus from the original, intended question.

> "Who was the person with the most feeling in the story? Think of the characters and their experiences. Which one had the most interesting experiences?"

This syndrome is usually caused by not writing down (ahead of time) the questions you are going to ask.
If you ask a question and people just sit there and look blank, relax--wait and say nothing (people usually need time to think)
If someone says I don't understand, don't rephrase the question, read the same question again.

Other comments, suggestions, or ideas:

_____

_____

2. Time to Think

A most important element in any discussion is allowing time to think. Many people have an incapacity to tolerate silence. Thinking processes are sometimes slow and painful. Wait for a response. When a prolonged silence ensues, support the person.

> "Would you like to keep working on your problem, or would you prefer to call on someone else to help you?"

If he decides to resolve the problem himself, be certain to call for his response when he has finally reached a solution. The same procedure may be followed when a student says:

> "I know what I want to say, but I can't say it."

Some ideas on how to correct

Important! Ask a question, then wait--wait--wait.
Keep your mouth shut.
If you wait two minutes and nobody has said anything yet, repeat the question exactly as you said it the first time. Wait.

Other comments, suggestions, or ideas:

3. Extending

Obtaining as much information as possible. Use as means to give people more time to think.

The extending question pushes for factual elaboration in response to the content of a comment. You might be probing for alternates, additions, analogies, and explanations mainly on the same level of the student's contribution. There is no striving to boost the discussion upward, only forward through expanding on what has been offered.

Select the extending question from each pair below.

1. a. Shall I write this statement on our list?
   b. Who can add to this statement?
2. a. Can you think of any other differences?
   b. Can we finish with differences now?
3. a. Are there any other workers that would be needed?
   b. Why are workers needed?
4. a. Can you tell me some more about soil erosion?
   b. What does the word erosion mean?
5. a. Which plays are you talking about?
   b. Maybe, if you think of the play we discussed last week, you can explain today's plot.

"Is there anything else that you would like to mention?"
"Any other ideas?"

Other comments, suggestions, or ideas:

4. Clarifying Content

The person expresses a concept which may not be clearly understood, either by him or the group. He is asked to clarify his meaning.

Asking for clarification is one way to respond to content. The clarifying question elicits the meaning of unfamiliar terms or the rephrasing of disconnected, fuzzy statements, to be sure you understand what the person means. This role also helps to clarify meaning for the rest.

In the pairs of questions below, which one fits the criteria for seeking clarification?

1. a. What do you mean by evaporation?
   b. Have we talked about evaporation already?
2. a. I'm not sure I understand. Can you say that another way?
   b. Do you all agree with this?
3. a. Why is climate important?
   b. Can someone help us with a definition of climate?
4. a. Are you saying the Aztecs had fertile soil?
   b. Which Indians had poor soil?

"Can you be more specific?"
"What do you mean by customs?"
"Can you say that in another way?"
"Can you give us an example?"

Other comments, suggestions, or ideas:

5. Focus and Refocusing

Focus questions are defined as the initiators of major shifts in a discussion, the three to five preplanned questions that pace and support the direction of thinking.

In the statements below, underline just the words that set the focus for students:

1. What I want you to do today is to look at the chart. Let's start by looking at the first two columns on the chart. Can anyone say anything that would be true about all these products?

2. Our list is long enough. Could some of these be grouped together? Which items could you put together?

3. If you had been the boy everyone called names, how do you think you would have felt?

4. Let's look at our chart for ways these animals are alike, no more on differences.

5. Who can summarize all that we have talked about in one sentence?

Sometimes in setting a focus, a teacher inadvertently poses a double focus. What disadvantages can you see in the following focus?

"What can you say about these people after seeing the film; what would you expect to find if you went to Mexico?"

Refocusing is essential at times, especially for people who wander off the track easily. The focus question may be repeated, or written on the board. Rewording may be necessary to start the flow of discussion if the original phrasing is misunderstood by those attempting to respond. Most refocusing is related to maintaining the discussion of the topic.

Which three of the following are clearly attempts to refocus the discussion?

1. Can someone summarize our discussion?
2. What I meant was, what differences do you see on these two graphs, not the ones from yesterday?
3. Are some of you thinking of the second experiment? Let's think of the first one and tell me what happened.
4. Which group of Indians used floating gardens?
5. Why were floating gardens necessary?
6. Let's hold that and continue with differences on our chart.

Other ideas:

"Now what were we discussing a moment ago?"
"How does that relate to the subject?"

Other comments, suggestions, or ideas:

---

6. Lifting

The skill of lifting the level of the discussion is the most difficult one to learn and one most often overlooked by a facilitator trying to master all the roles in a discussion. It is classified with the focusing questions because it, too, plays a role in raising the level of mental operation through seeking causality.

Discussions that are disappointing to a facilitator are often the result of not pursuing the "whys" with persons who almost, but not quite, discover broad generalizations. The designed focus questions are intended to lift the discussion away from the concrete, but people do not necessarily think according to a model. Between the patterned lifts there are unplanned, unforeseen occasions for abstract thinking if the facilitator recognizes the moment and inserts a why-type question. Seizing these opportunities to lift the level of discussion reflects a facilitator's skill. Individual lifting questions cannot be prepared in advance because the direction of any one student's contribution is unpredictable. These are the automatic questions for pursuing thinking with one person. Through one or a series of questions the facilitator assists a person to build a chain of relationships that may or may not end in a generalization or inference.

Which question in each set attempts to lift the level of thinking?

1. a. Are you saying that riots will affect our laws?
   b. How might riots affect our laws?
2. a. Why is the Fourth of July a holiday?
   b. Why do we have holidays?
3. a. Could you explain further?
   b. How do you account for that?
4. a. Why do you think this is a good conservation practice?
   b. Can you explain this conservation practice?
5. a. Why do you suppose Macbeth changed?
   b. What changes in the characters did you notice?

7. Summarizing Content

When a person elaborates on an idea at great length, or the meaning of his statement is buried in an extended discourse, he is asked to state it in a more succinct manner.

"How can we put what you have just stated on the board?"
"Can you give us the main idea of what you are saying?"

The summary questions used at the end of certain tasks and at the end of the session are one of the most exciting and important parts of each lesson. These questions are designed to:

1. ALLOW PARTICIPANTS TO DISCUSS THE IMPLICATIONS OF WHAT THEY LEARNED TO THE MANAGEMENT OF THE ENVIRONMENT.
2. ALLOW PARTICIPANTS TO GENERATE THEIR OWN CONCEPTS AND GENERALIZATIONS ABOUT WHAT THEY HAVE DONE.

"How can we summarize all the things we've done and discussed in one or two big ideas?"
"How can we summarize our discussions and investigations about water?"

Other comments, suggestions, or ideas:

RECAP

A facilitator responds to the PARTICIPANT through
- accepting
- encouraging
- supporting

Also considering such things as rewards, restricting words, polly parrot, leading loaded questions.

A facilitator responds to the completeness and relevancy of the subject being discussed through
- clarifying
- specifying
- extending
- focusing
- refocusing
- lifting

Also considering such things as: multiple questions, time to think, summarizing content.

Other comments, suggestions, or ideas:

REVIEW OF DISCUSSION SKILLS

Write in the appropriate skill in front of each question.

A. Discussion skills that might affect peoples participation (Accepting, encouraging, and supporting)

1. _____ You said the land was different. All right.
2. _____ Let's give John a chance to tell it his way.
3. _____ Has everyone had a chance to say what he thinks?
4. _____ Shall I come back to you later?
5. _____ That's an interesting idea.
6. _____ Does someone want to disagree?
7. _____ You can say it again if you want to. Maybe some of the boys and girls didn't hear Mary when she said it.

B. Discussion skills that might affect the completion or relevancy of the suoject (Focusing, refocusing, and lifting)

1. _____ Let's hold that and continue with differences on our chart.
2. _____ How do you account for that?
3. _____ Why do you suppose Macbeth changed?
4. _____ Our list is long enough. Could some of these be grouped together? Which items could you put together?
5. _____ Are some of you thinking of the second experiment? Let's think of the first one and tell what happened.
6. _____ Why do you think this is a good conservation practice?
7. _____ Who can summarize all that we have talked about in one sentence?
8. _____ Which of these groups wanted change?
9. _____ What do you mean by evaporation?
10. _____ Are there any other workers that would be needed?
11. _____ Are you saying the Aztecs had fertile soil?
12. _____ Can you think of any other differences?
13. _____ Which workers on the list are you thinking of?
14. _____ I'm not sure I understand. Can you say that another way?

C. Teacher responses to the person or to the content

1. _____ Let's listen again to his reason.
2. _____ Which Indians are you talking about?
3. _____ Does anyone want to add to this statement?
4. _____ Now do some of these items seem to go together?

C. EXAMPLE OF HOW AN INTERPRETATION OF DATA QUESTION SEQUENCE AND DISCUSSION SKILLS MIGHT GO TOGETHER

Type of Question	Objective or Purpose of Question	Examples of Discussion Skills you might use (or what you do with the response you get from the audience)
Open	1. To elicit a universe of facts, concepts and ideas upon which to operate. 2. To provide an opportunity for every person to become initially involved in the discussion.	Accepting Supporting Extending
Focus	1. To focus on specific points to be compared, contrasted and related to other points. 2. You may have to focus in on several specific points, needed to compare, contrasted in the interpretive questions.	Focus Clarifying Extending
Interpretive	1. To compare, contrast and relate specific points brought in the focus question(s). 2. Questions (or series of questions) which call for the students to draw a relationship between two or more points in the data.	Focus Clarifying Extending Lifting
Capstone	1. To more the discussion to the verbalization of high-level abstractions. 2. Questions that call for conclusion, generalization or summary.	Time to think Summarizing

VII. IDENTIFYING DIFFERENT GROUPING ACTIVITIES

From: Dr. Mike Giammatteo

Mini-Market

Talking about reason for meeting (10-15 minutes)

Station personnel at prepared displays to tell part of story. Keep audience moving in 10-person sized groups (30 minutes)

Have factual sheets -- Historical
Current
Future (½ sheet blank)

Example:
- How much land
- Cost to taxpayers
- How many jobs come from the land
- Lumber sold
- How many visit, use, etc.

Have participants fill in their ideas about the future of the issue/area of concern. (15 minutes)

Issue Analysis -- Short version
Use 3 X 5 Cards

Questions to ask:

1. What concerns do you have about forest land management?
   What concerns do you have about this area of land?
   What concerns do you have about this issue?
   Write two concerns on your card---
   (5 minutes)

2. What ideas do you have to reduce or eliminate the concerns noted?
   List those on your card---
   (5 minutes)

3. Get into groups of 6 people and---
   a) see if there are any common concerns
   b) common solutions

   Make a groups list of---
   a) common concerns
   b) common solutions

4. Turn into meeting coordinator for compilation, reproduction, and dissemination to all people at meeting.

5. Meeting coordinator announces that all participants at this meeting will receive compiled list, names of all participants, and date of next meeting.

ABC EXERCISE

Preparation and Training--
Dr. Mike Giammatteo

Problem--Helper--Observer

Whole idea of communication is the way we:

Share ideas (sending messages)
Listen (receiving messages)
Feedback (to tell how well you send or receive messages)

1. Pass out (at random) cards marked A, B, or C---one to each person.

2. Ask each person to write (on card) one problem or concern (dealing with public involvement or a real concern pertaining to a job, etc.). (take 3 minutes to do this)

3. Then ask the people to break into groups of three (one A, one B, one C). (Ask them to get with someone they usually do not work with).

   a) A will be the first to state his problem (he has written).
   b) B will act as Helper or Advisor.
   c) C will act as Observer to Give Feedback. (Take notes on: how well A has stated problem and is receiving help; how well B is helping and advising).

   This should take six minutes, with one minute for feedback from C.

4. Switch roles:

   a) B states problem.
   b) C acts as Helper/Advisor.
   c) A acts as Observer.

   This should take six minutes, with one minute for feedback from A.

5. Switch roles:

   a) C states problem.
   b) A acts as Helper/Advisor.
   c) B acts as Observer.

   This should take six minutes, with one minute for feedback from B.

6. Ask one person from each table (or group) to collect the problem statements and remain another 15 minutes or so to help regroup and list these concerns. This list of concerns would then be passed on or mailed to each participant.

   Remind participants: We collected your name and address as you came in so we could mail this information to you.

7. State what further involvement and input might be needed from participants.

CONCERN CARDS

From: Dr. Mike Giammatteo

Option #1:

At a group meeting, distribute 3x5 cards to each table or area.

Ask that any time anyone has a concern or a question (either about the activity being done, or its implications), write that question or concern on one of the cards.

Cards may either be:
dropped in a designated box
placed in a designated spot on the table

Mention that cards will be collected at pre-arranged time intervals throughout the meeting.

Each card will be read, and the leader and/or group will react to those questions or concerns.

Option #2:

At a group meeting, distribute 3x5 cards to each person.

Ask that each person write down some question or concern above _____ _____ (whatever the case may be).

Cards will be unsigned, collected, and read to the entire group.

As each card is read, the leader and/or group will respond to the questions and concerns.

Concern Card Analysis

People have a need to be recognized.

It's easier to respond on 3x5 cards.

*It helps the leader understand the needs of the group. (He has information about general and immediate concerns.)

Enables leader to help people help themselves, and still allows people the opportunity to express their immediate concerns right now and know that their concern will be dealt with during the session.

Builds confidence and trust in the leader--he wants to know your concerns, but he also wants you to gain some skills (long range) so he provides a way for both to happen.

Implications:

Prevents the 'axe-grinders' from dominating the meeting.

Prevents 1-2 people from 'venting' concerns that are not concerns of the majority of the group.

People have to put their concerns and questions down in writing so they can't use the pretense of 'asking a question' to give a 15-minute speech!

People have a chance to clarify their own questions or concerns by putting them down in writing.

Charges--Denials--Facts

From: Dr. Mike Giammatteo

In this case you acknowledge that the concerns have been identified.

People need a chance to 'vent'--so you provide it in small groups.

(Don't be afraid to get people into groups and even the odds. Reduce the input to an honest level).

CHARGES	DENIALS	FACTS

Directions:

Reduce the number of charges to 2-3 you feel most important.

List the denials identified by individuals or groups concerning the charges.

List the factual data (or its source) concerned with each of the items in 'Charge-Denial.'

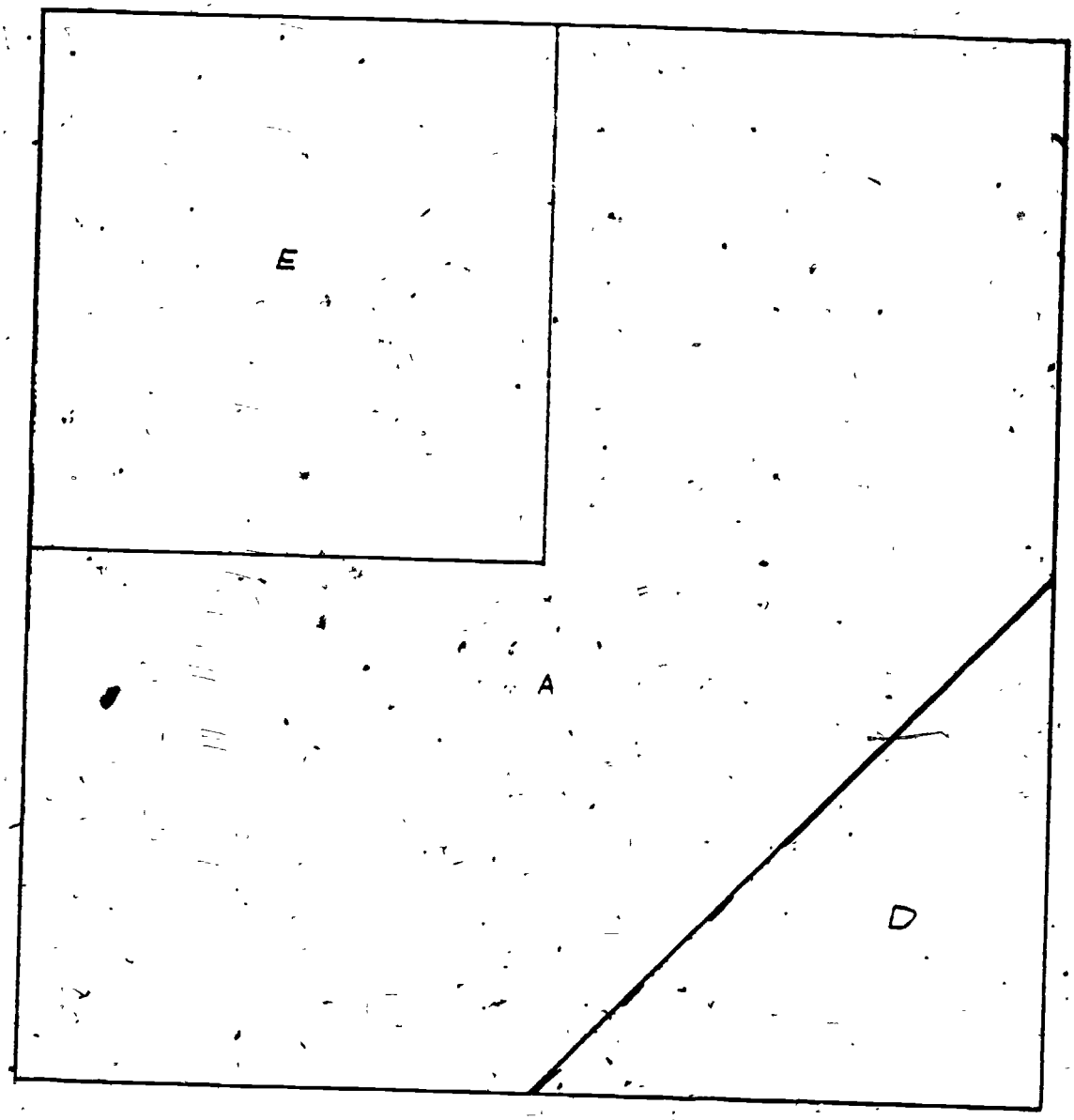
(If the facts are not available, state what plans exist for obtaining those so charges and denials by opposing groups may be verified)

Try to neutralize the agency role and throw the responsibility onto the participating groups.

VIII. DEVELOP A PLAN OF ACTION FOR CONDUCTING A MEETING

Task M

Based on the things we've done, discussed and read, develop a meeting format that will define the objective of the meeting, type of meeting, maximize total group participation, minimize polarization of participants, and will allow for the highest quality usable input. (Work in groups of 3-4.)


E
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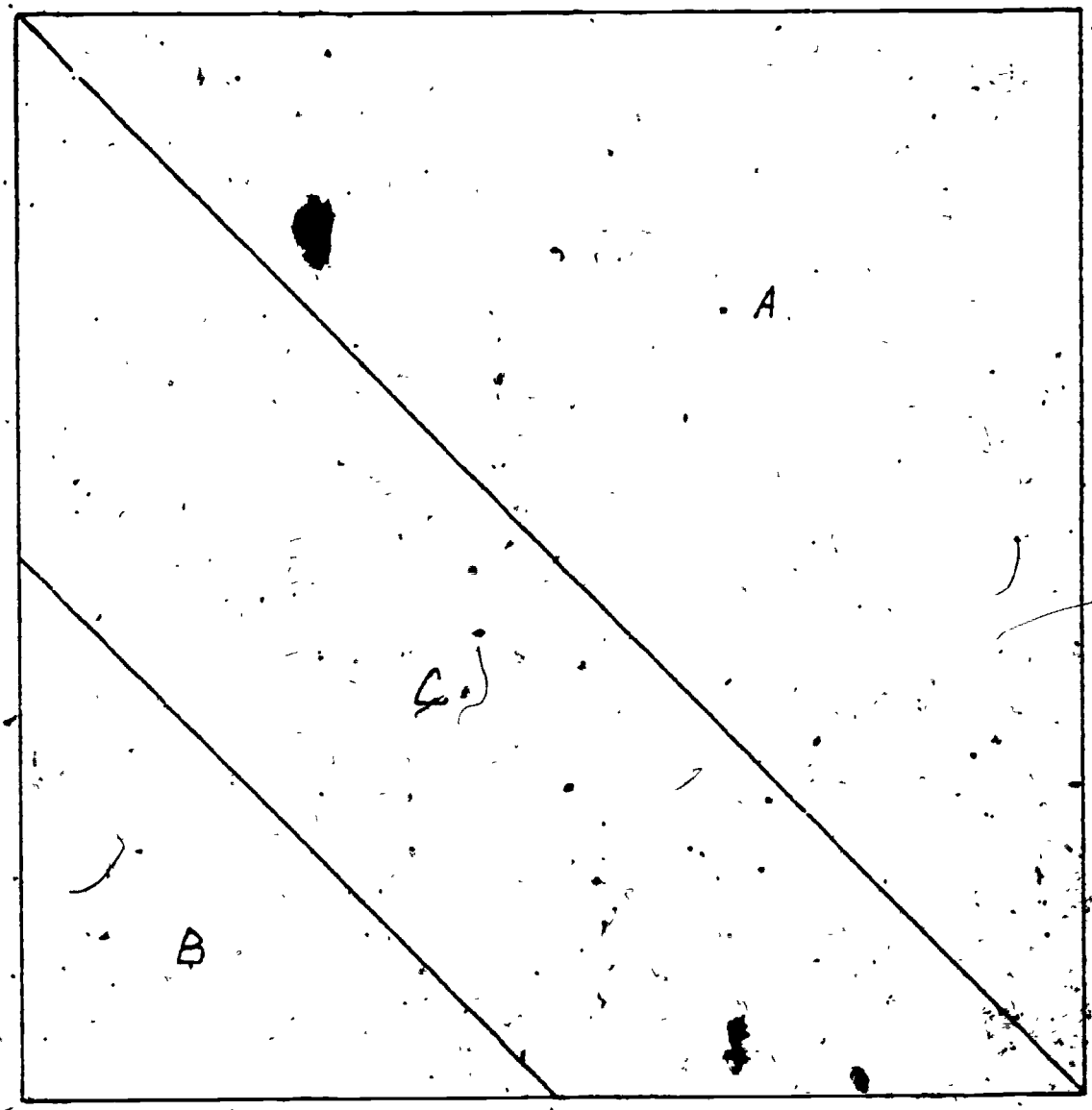
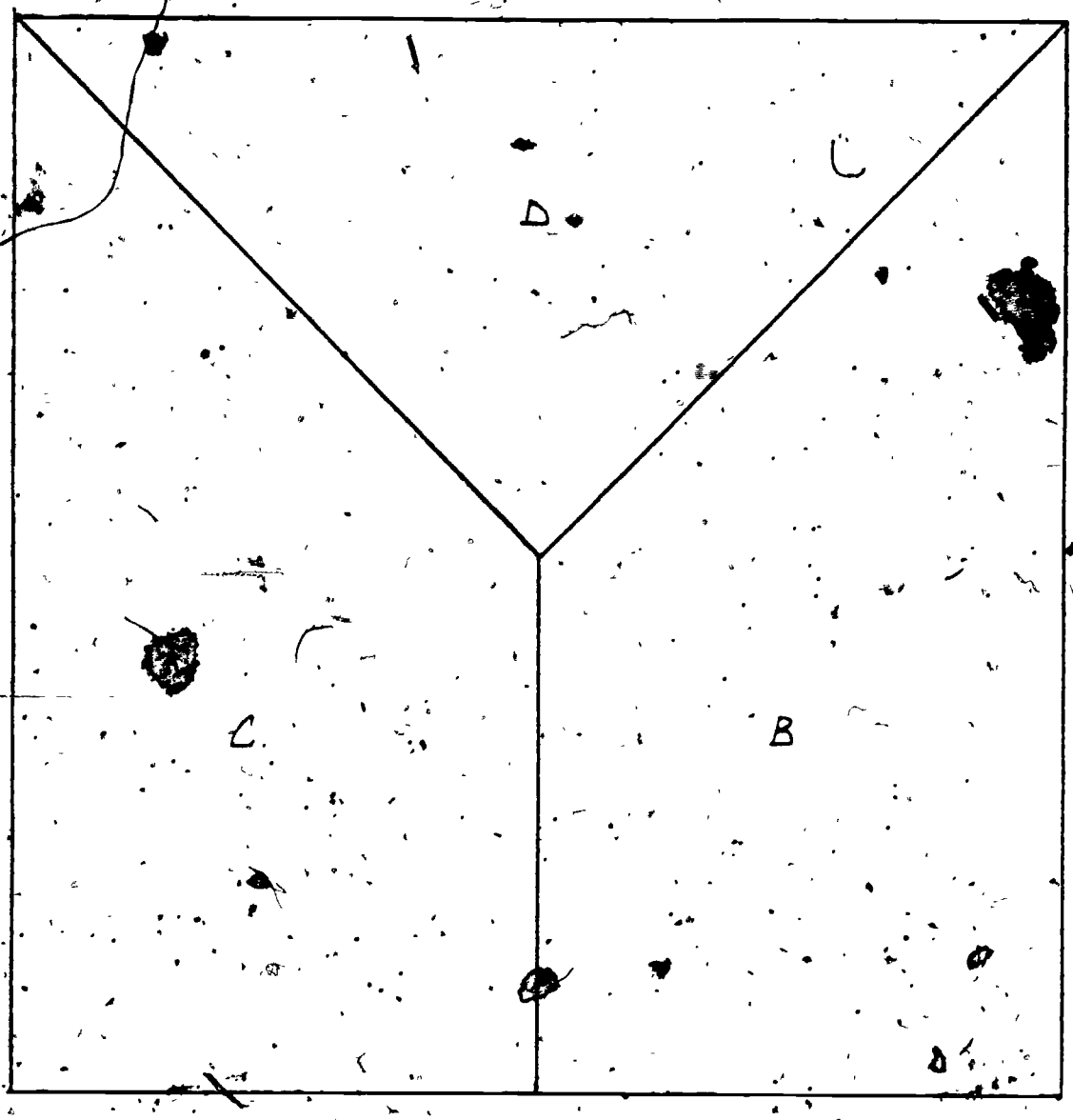
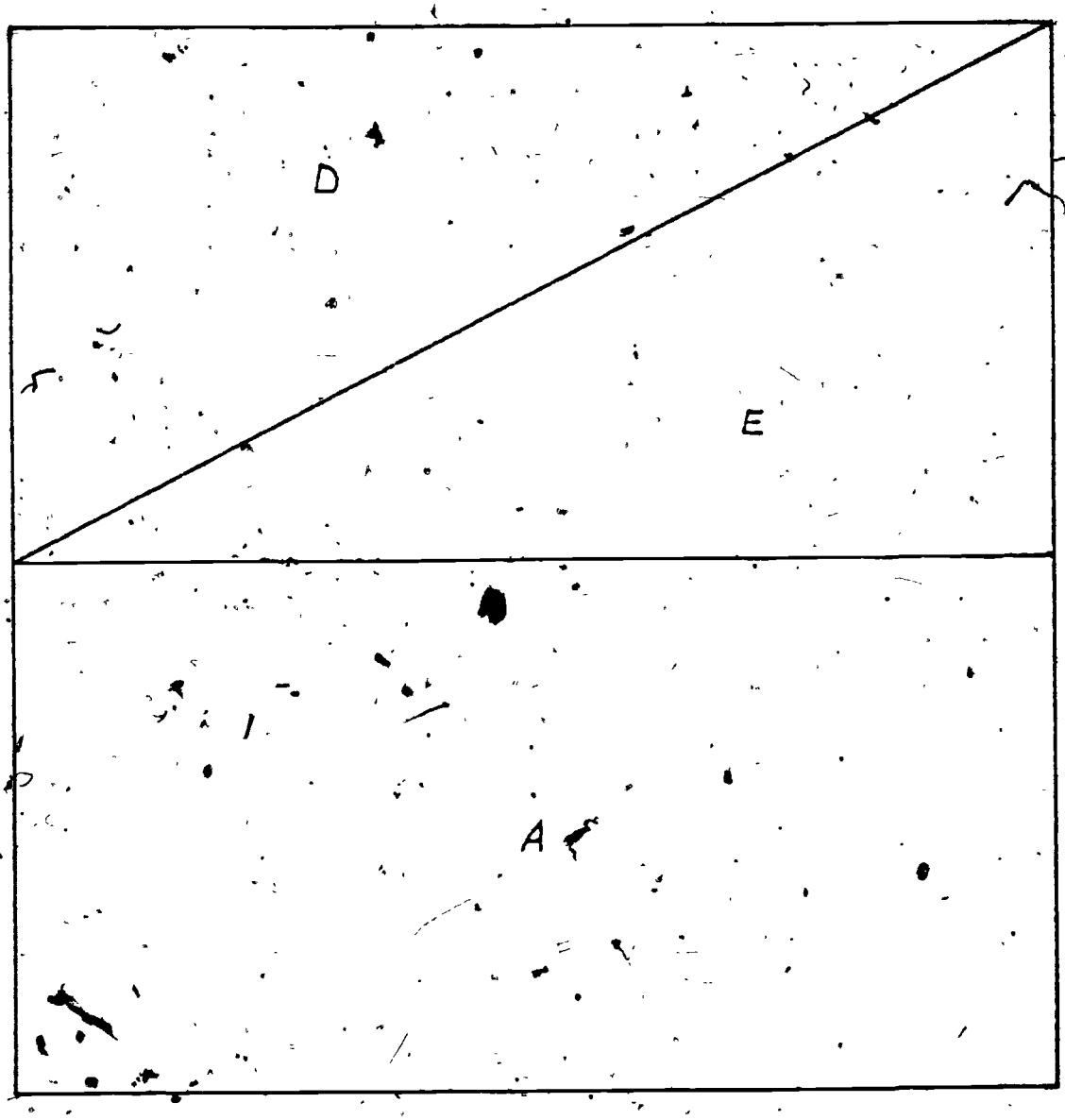

A
B

233


D
C
B


D
E
A

PLACATOR

° You are to play the placator role in solving the following problem

° The Problem:

It is 90° outside - your group has to decide whether or not to go on a picnic - it is 2:30 p.m.

° Examples of Placator--always soothes over a discussion
"Everything in due time"
"The sun will shine tomorrow"

ATTACKER

° You are to play the attacker role in solving the following problem

° The Problem:

It is 90° outside - your group has to decide whether or not to go on a picnic - it is 2:30 p.m.

° Examples of Attacker--always attacks ideas presented or will be negative.
"You know the administration will never go along with that"
"People don't care, our group would never do that without pay"

IRRELEVANT

° You are to play the irrelevant role in solving the following problem

° The Problem:

It is 90° outside - your group has to decide whether or not to go on a picnic - it is 2:30 p.m.

° Examples of Irrelevant--ideas given that do not relate to the topic (evader).
"Did you see the movie last night?"
"Who's bringing the coffee for the next meeting?"

SENSIBLE (YOU ARE TO START THE DISCUSSION)

° You are to play the sensible role in solving the following problem

° The Problem:

It is 90° outside - your group has to decide whether or not to go on a picnic - it is 2:30 p.m.

° Examples of Sensible--always tries to be as sensible as possible.
"Let's review where we are"
"Why don't we get back to the purpose of the meeting"

DEVELOPING AN ENVIRONMENTAL EDUCATION ACTION PLAN

If man is to develop an increased understanding about his relationship to his environment and how to take positive action for its improved management, then it is important to plan for a series of logical and comprehensive environmental learning opportunities that relate to his needs and the needs of society and the environment. These learning opportunities should be a part of an overall environmental education plan. Some of the component parts of an environmental education plan are embodied in the following action planning sheets.

Environmental education action should reflect the adult education community as well as school children.

Listed below, for your information, are objectives from the proposed plan for Environmental Education--State of Oregon.

PROGRAM AND CURRICULUM DEVELOPMENT AND COMMUNITY EDUCATION

Objectives: To improve the learning of basic skills (reading, writing, arithmetic) by providing experiences that allow for application of those skills in the total environment.

Application of these skills in a problem-solving approach to the environment will give children the motivation and competency to develop personal and group responsibility toward their social and natural environment.

Objectives: Provide environmental courses that involve the community public in activities resulting in an increased understanding of the environment, man's relationship and responsibility to the environment, and a motivation to participate in environmental problem solving, especially at the local level.

Provide opportunities in career development for students interested in environmental occupational training.

TEACHER TRAINING

Objectives: To improve teacher education by giving the teacher the tools to become highly skilled in involving students in the total learning environment. The application of these tools will develop interactions between a student and his environment that can lead to the development of his responsibility toward his society and environment.

EDUCATIONAL FACILITIES

Objectives: To identify and develop a network of educational facilities necessary to implement and improve a total quality educational experience for all students (K--adults including lay people).

PUBLIC UNDERSTANDING AND SUPPORT

Objectives: Close the communication gap by gaining acceptance and support on a local level of existing and new school district environmental education programs.

Close the communication gap by gaining acceptance and support on a state level of a state environmental education plan.

The following materials are designed, with samples and reference materials behind each Action Planning Sheet, to assist in the development of your Environmental Education Plan. Notice that behind each planning sheet are materials to assist you in the development of your Environmental Education Plan.

These materials are not designed to be all inclusive, but only to provide you with some reference information.

Materials include:

DEVELOPING AN ENVIRONMENTAL EDUCATION ACTION PLAN FOR YOUR AREA

Inventory:

Do you have an Environmental Education Committee or equivilent in your community? Does it include a cross section of community people?

List the existing environmental programs in your area.

Do they range from Kindergarten to adult education?

What voids are there?

List the environmental areas used as classrooms.

List the additional ones that could be used.

What environmental education teacher and rescurce people workshops have been held in your area in the past two years?

What type of environmental awareness workshops have been conducted or are being conducted or being planned for community people in your area?

ACTION PLANNING FOR ESTABLISHING A LOCAL ENVIRONMENTAL EDUCATION COMMITTEE

List the steps involved in setting up an environmental education committee in your local area.

Community (or area or regional) Needs in EE.	How the EE Committee Could Meet That Need.

Identify key people and groups to be included in EE Committee.

People and Groups to be Included on EE Committee	Reasons for Their Being Included

Projects the committee might do to help needs:

Short-term projects:

Long-term projects:

(Select 1-2 projects from the above list that the EE Committee could initiate and complete in one year.)

Project:

Steps to Implement the Project	Target Dates

SAMPLE CHART

Functions of the EE Committee

People or Groups Who Might Help EE Committee	Identify Local ESA for School Use	Teacher In-Service	Provide Forum for Sharing EE Concerns	Disseminate Info of Local Current Envir. Problems	Assemble Current EE Material for School Library	Etc.
Park & Rec. Department		Site				
School Dist. Superintendent		Support				
Turned-On Teacher		Help Plan & Instruct				
News Media		Publicize				
Federal Agency		Provide Resource People &/ or site				
Local Planning Commission		Provide Maps, charts Info. on studies				
Civic Organization		Provide steak bbq				

Construct a chart similar to the sample above. Put in your own column headings for:

a. People or Groups Who Might Help EE Committee
b. Functions of the EE Committee

This chart can be a planning tool for initiating and implementing various functions of the EE Committee.

A CHECK LIST OF IDEAS FOR AN ENVIRONMENTAL EDUCATION COMMITTEE
(Compiled for Teacher Comments)

Provide foundation for carrying out an environmental education program in an area.

Purpose of council

a. Provide environmental training for educators and other interest groups (B.S.A. leaders, church groups).
b. Selling group for environmental education.
c. Guidance and advisory group.
d. Locate technical assistance for carrying out an environmental education program.
e. Contact point for state and regional groups in environmental education.

People on council

a. Group structure
   1. Figureheads - provide influence and stature to the group (mayors, state reps.).
   2. Technical resource people (local, state, and federal resource agencies).
   3. Concerned people who don't have the knowledge of environmental education, but have driving force for action
   4. Key educators and administrators, principals, school boards, teachers.
b. Make up by size of area
   1. Large towns - target group--focus on educators and board of education because of large number of people.
   2. Small towns--can cover all the towns, interests and types of people.

Jobs of council

a. Set up a training team of resource and environmental educators.
b. Establish workshops for educators and other interest groups.
c. Set up environmental study areas.
d. Guidance for school programs.
e. Clearing house for assistance to educators (provide information on who to contact or directly supply the technical assistance).
f. Inventory what other groups are doing in environmental education, and try to provide central direction.

ENVIRONMENTAL EDUCATION COUNCILS

Many people including educators and natural resource managers are concerned at the lack of learning experience in school that will help a child observe and relate to his total environment. These types of experiences are imperative in developing an intelligent society capable of properly managing our environment. Many teachers are interested, but do not have the skills or experience to provide conservation and outdoor learning experiences for students. Resource people can assist educators in developing facilities, activities, and curriculum for these programs.

Environmental education councils have been successful in planning and implementing programs in many areas. You may already have a committee or council that is concerned with some aspect of an environmental education program such as the County Conservation Day Committee. It may be a simple matter to enlarge the committee's membership to include more educators and resource people and to broaden the existing committees objectives and program. Objectives of such a council is usually concerned with the implementation and coordination of environmental education programs with the existing school program.

WHO SHOULD BE ON THE COUNCIL?

The council should consist of educators and resource people who can exchange ideas and activities to enhance the development of quality school programs. Members should include, but not be restricted to, County School Superintendents, School District Superintendents, building principals, Curriculum Directors, classroom teachers, County Extension Agents, Resource agency and private organization representative civic group representation, park and recreation district representative college people, news media, etc.

WHAT CAN THE COUNCILS DO?

1. Teacher workshops.
2. Help plan and develop on-site schoolyard classrooms and activities.
3. Build self-guided nature trails.
4. Develop conservation teaching aids and activity sheets.
5. Provide coordination and dissemination of teacher requests in environmental education programs.

SOME STEPS IN ORGANIZING A LOCAL COUNCIL:

1. Invite a few key interested educators and resource people to a meeting to explore the possibility of establishing a local environmental education council.

2. If the group agrees to the need for a council, then set up a planning subcommittee to decide on who to invite to the organization meeting, develop the program agenda, time and place. (Invitees should be those people that the planning committee identifies as action-type people who will get job assignments done.)

The program might include some knowledgeable speaker who has had experience and can orient the group to the environmental education job in the schools and identify specific action jobs the committee can do to be effective. Don't get tied up in a lot of philosophy.

3. Hold meeting and have discussion on the needs and concerns in environmental education. (Have recorder take down pertinent ideas, existing programs, examples of programs elsewhere, new programs needed, contributions of manpower, materials, etc., offered, etc.)

   Appoint temporary chairman and secretary. Chairman should appoint an ad hoc committee to digest meetings discussion and formulate a short report for the next meeting giving action recommendations for the direction of the group. Recommendations should be specific and relevant.

4. Have second meeting one month later to discuss recommendations, (mail out ahead of time), changes or additions. Adopt committee charter and subcommittee assignments. (Every person of the council should be assigned to a subcommittee or given some task.) Decide upon the first project the committee wants to undertake. It should be short, easy to plan, outside and assured of success. Examples are: One-day teachers' workshop on a schoolyard or along a nature trail; taking school administrators and school board members on a resource management show-me trip; helping a principal plan an outdoor laboratory on a schoolyard, etc.

5. Continue monthly meetings or regular meetings as needed.

6. Hold first project, have news coverage.

7. Continue to work with the educational community in as many ways as possible to enhance the educational experience in the schools.

8. Plan on having at least one or two activities involving the public schools each year.

EXAMPLES OF EXISTING COUNCILS:

1. King County Environmental Education Council, Seattle, Washington.
2. Kittitas Conservation and Outdoor Education Council, Ellensburg, Washington.
3. Chelan-Douglas County Conservation and Outdoor Education Council, Wenatchee, Washington.
4. Snohomish County Environmental Education Council, Everett, Washington.
5. Pierce County Conservation and Outdoor Education Council, Puyallup, Wa.
6. Clark County Environmental Education Council, Vancouver, Wa.
7. Metropolitan Outdoor Education Council, Portland, Oregon.
8. Lane County Conservation and Outdoor Education Council, Eugene, Oregon.
9. Jackson County Conservation and Outdoor Education Council, Medford, Ore.

Contacts for these councils can be made through the following:
Mr. David Kennedy, Environmental Education Consultant, Supt. of Public Instruction's Office, Olympia, Washington.

Bus Vance, Environmental Education Consultant, Oregon Board of Education, Salem, Ore.

One of the most beneficial programs the council can do is conduct teacher in-service workshops.

SOME PROGRAM ACTIVITY SUGGESTIONS

1. Sample One-Day Conservation Workshop for Teachers

An important objective of a one-day teachers workshop is to involve the teacher in doing activities outside on the schoolyard, nature trail, in the forest, etc. The workshop can be held on Saturdays, professional teaching days, preschool orientation week, etc. The subject areas can be manned by resource people, and must not be lectures but group activity-oriented sessions.

8:15 a.m. Leave assembly point by bus for workshop area.
9:00 a.m. Arrive at area and assemble for orientation to field study.
Coffee break.
Each group of about 20 teachers will rotate through three different resource subject areas. If more than 60 teachers total, then have two soil groups, two plant groups, etc.

	Subgroup I (20 teachers)	Subgroup II (20 teachers)	Subgroup III (20 teachers)
9:30 - 11:00	Soils	Plants	Wildlife
11:00 - 12:30	Plants	Wildlife	Soils
12:30 - 1:30	Lunch		
1:30 - 3:00	Wildlife	Soils	Plants
3:00 - 3:30	Written Evaluation		
3:30	Leave by bus for Roseburg		
4:00	Arrive Roseburg		

Each resource group will participate in "doing" activities to better understand the resources and their interrelationships on the area.

For example: Soil - Make micromonolith, feel and see soil structure and texture, observe soil-plant relationships, etc.

Plants - Use increment borers, tree identification, plant competition, determine tree volume, take range transects, plant-soil-animal relationships.

Wildlife - Find evidence of wildlife, discuss and construct wildlife habitat, discuss and observe animal-soil water relationships.

Other - Other subject areas can include; Water, creative arts, Language arts, survival, range utilization, etc.

2. Developing Schoolyard Classrooms

Many schoolyards can be improved to become a relevant outdoor classroom. Here are a few items that can be done:

a. Develop a soils pit
A soil pit large enough for several students to get into and conduct studies of soil horizon depth, texture, structure, PH, root penetration. There should be such a pit for each different type of soil in the area. Should be fenced so students can't fall in, consider a roof over the pit. Studies in characterictics of soil productivity, soil development, geography, economics.

b. Develop an arboretum of native plants.

An area planted to the native plants, trees, shrubs, ground cover plants, ferns, mosses, fungus, lichens. This is a long term project. The sun-loving plants are planted first and as ground shade is produced, shade-loving plants such as ferns, etc., can be added. Studies in plant succession, observational skills, classification, aesthetics.

c. Develop habitat for small game

Areas along the fence rows, odd corners and even some landscape areas around buildings can be planted to multiflora rose, bitter cherry, mountain ash, indian plum Cascara, etc., and will provide aesthetic screening from neighboring houses, protection for birds and small mammals. Studies in animal habits, feeding migration, classification, aesthetics.

d. Develop landscaping around school buildings

Provides aesthetic appearance, benefit and credit to community. Beautify the school grounds and blending of buildings to fit the schoolyard. To reduce classroom glare and solar heat problem, thereby increasing effectiveness of classroom learning environment. Enlarge study of plants and new animal habitats.

Should be accomplished as a part of the overall learning environment plan for entire school property at time school is built. Many native and introduced plants lend themselves to low cost maintenance and maximum aesthetic educational values.

Studies in aesthetics and beauty of our school, classification and study of new plants, difference and reason for soil temperature in culturalized flower beds and compacted turf areas.

Difference in ornamental plants from native plants. Difference in wildlife found here from other areas. Shade as a factor in temperature change.

3. Nature Trails with self-guided booklet

Nature trails are developed in areas that have some natural resource features that can be interpreted and discussed with students. These are outdoor museums where the student observes, makes inferences about what he sees and then can discuss it with his class. The tour booklet helps the teacher prepare for the experience by giving her background information and by listing some questions that she can use as an interest starter for the lesson. The Audubon Society, Park Service, and U. S. Forest Service have several publications available as references in the development of nature trails.

4. Conservation Teaching Aids and Activity Sheets

Many times the teacher is at a loss for ideas and activities to use in the outdoors. The council members could develop simple experiment sheets on subjects such as inventorying range readiness, determining volume of tree, making soil analysis, indentification of aquatic insects, or rules of thought about soil-plant relationships.

Teaching aids can be activity oriented. They should be designed to provide the teacher with student involvement in observation, measurement, classification, inferring and setting up simple experiments in the outdoors.

EXAMPLE OF ONE SET OF OPERATING GUIDELINES

1. This council will be known as the "King County Environmental Education Council."

2. Council Objectives:

   A. To provide for the wise use of natural resources through environmental education programs.

   B. To provide a forum where educators, resource managers, and other interested citizens can share concerns and information in the area of resource use education and seek cooperative solutions to their common problems.

   C. To provide environmental education experiences for our country's youth.

   D. To coordinate requests from schools for resource people to assist with field trips, conservation projects, development of school sites and similar educational ventures.

   E. To foster training for teachers in environmental education through local in-service programs, teacher workshops, and educational television.

   F. To assist schools in integrating environmental education into their curriculum, publications, bibliographies, scope and sequence charts, and other conservation teaching aids.

   G. To act as a liaison with other environmental education committees, the Natural Resources Forum of Washington, Conservation Education Association, and other groups dedicated to furthering the wise use of our natural resources.

3. The Council will be composed of interested representatives and/or individuals from citizen groups, education, industry, government and others who support the objectives of the council.

4. The council will meet monthly. Special meetings may be held as needed.

5. Council officers will be chairman, vice-chairman and secretary-treasurer. They will be elected by majority vote at the Spring meeting and serve one year. Officers will rotate: when the chairman completes his term, he will be replaced by the vice-chairman, and the secretary-treasurer wil become the vice-chairman. Thus the secretary-treasurer will usually be the only new member each year.

6. Each member of the Council will be appointed to a subcommittee.

7. These By-Laws may be amended by majority vote of those members present at any regular meetings.

8. An executive council, comprised of the Chairman, Vice-Chairman, Secretary Treasurer and immediate Post Chairman, is empowered to carry on routine council business between regular meetings of the full King County Environmental Education Council.

SUGGESTED SUB-COMMITTEES AND JOBS FOR COUNCIL TO IMPLEMENT

I. Outdoor Classroom Sub-Committee:

A. Review by-law objectives C&D and suggest tangible ways in which they may be implemented.
B. Assist schools with evaluation and development of potential outdoor classrooms. These include schoolyards, parks, natural areas, etc.
C. List major problem areas we should consider for next year.

II. Teacher Training Sub-Committee:

A. Review by-law objective E and develop and coordinate one-day environmental education teacher workshops.
B. Disseminate information on conservation workshops and scholarships to teachers.
C. Explore role of educational television in teacher training.

III. Curriculum Integration Sub-Committee:

A. Evaluate major problems in environmental curriculum planning.
B. Plan how by-law Objective F best be accomplished.
C. Work out method of placing conservation education material currently available in school libraries within area.

IV. Educational Tours Sub-Committee:

A. Review by-law objectives C, and D, and suggest ways in which educational tours offered by various private and governmental organizations can help achieve these objectives.
B. Make listing of existing tours available to schools. Suggest how this listing may be best distributed to school administrators.

V. Extension Sub-Committee:

A. Suggest ways of implementing by-law objective G.

VI. Coordination of Requests

A. Review by-law D and explore ways of coordinating school requests for environmental materials and resource people.

ACTION PLANNING FOR ESTABLISHING AN ENVIRONMENTAL STUDY AREA PLAN

1. What function does an Environmental Study Area serve?

2. a. List the possible steps that might be involved in initiating an Environmental Study Area project in your area:
   b. Number the steps in the sequence they might be done.

3. Name the people or groups who might help in the inventory and use of Environmental Study Areas:

4. Develop a matrix showing jobs to be done and people to do them. Use information from #2 and #3 above.

People or groups who might help in inventory and use of ESA from #3 above.	Steps and target dates in initiating an ESA project, from #2 above.

A CHECK LIST OF IDEAS FOR ENVIRONMENTAL STUDY AREAS
(Compiled from Teacher Comments)

Identify need for Environmental Study Areas.

Environmental Education Council should include a committee (team) for E.S.A. to identify, select, inventory, each site and determine guidelines for its use and management.

Goals

Determining individual commitments by members of our committee and our group-- establish a committee.
Involve total community--missing as few people as possible.
Education formally will be a sub-action of the community committee.
Get action to replace words--a timetable.
Identify individuals interested--agencies and committees already involved established committee.
Involve resource people, civic organizations, informal and formal groups, interested groups, clubs.
School--representative appointed by Superintendent.
Meet--for action.
Encourage active participation and community leadership.

Develop criteria for priorities of land selection.
What ecosystems do we want to study?
Look for an area or areas that represents several ecosystems and environmental situations.
Comparisons natural vs. man-made.

Inventory Jobs

Who
Divide the job of inventory
a. Natural areas
b. Urban
c. Rural
How - field investigation

Reports or record
a. Map
b. Photogrammetry
c. Photos
d. List of what is on area (narrative)
e. Distance from school

Selection

Prepare a plan of development and show to best use the selected areas.
Which of the inventoried will we use and promote?
Prepare a summary of areas with our recommendation.
Availability of land.

Development

Secure approval for (ownership?) use from appropriate agencies and individuals.
Inventory existing physical features.
Determine desirable additions--development priorities, including: Timeline and master plan, safety, access to and through et al.
Implement and coordinate: a. Work forces, b. Finances, c. Public relations, community involvement.
Develop in-service program for interested teachers, etc. (require it before use of E.S.A.'s)

Promotion of area

Meet with local press, community leader and groups.
Initiator--stir interest--locate other interested parties.
Gather interested people for local site committees.
Set some objectives based on local needs. Committee would develop selling approach to proper officials.
a. Promote inventory of potential sites
b. Promote use of sites

ENVIRONMENTAL STUDY AREA PLAN

The educational process must encompass a wide variety of learning environments in order to equip our young people with the educational tools necessary for intelligent and effective environmental management.

There are many opportunities outside the classroom that provide students with a variety of environmentally oriented experiences.

Teachers and administrators must be able to identify and use these "outside-the-classroom" environments to complement the existing school curriculum.

One term applied to these learning environments is Environmental Study Areas (E.S.A.). These areas can be used for the application of basic learning skills through collecting and interpreting data, identifying environmental problems, exploring cause-and-effect relationships, and developing alternative solutions to environmental management.

An environmental Study Area is a place, then, where a person can become involved in investigating some aspect of man's relationship to his environment (natural or man-made). It can range from a near natural area to the man-altered areas of urban renewal.

Steps to initiate an Environmental Study Area project in your school district might include:

Inventory the Environmental Study Areas of Community (natural, man-made, man-altered, etc.).

Inventory professional and avocations that can make a contribution to improving the interaction between students and their community environment.

Develop a broad curriculum spectrum to visually show how the school site, local E.S.A., profession, avocations, etc., fit into the educational objectives.

Hold a series of environmental-awareness workshops and meetings for the public, teachers, students, etc., to unveil and discuss the proposed total community environmental education project.

Establish a series of lay committees (students, teachers, community people) to develop learning packages to fit the environment, needs of kids, teachers, and educational objectives.

Parts of the project include in-service training courses for teachers to develop additional skills in the use of E.S.A.'s (such as setting up problem solving situations, data collecting experiences, etc.).

SCHOOLYARD DEVELOPMENT

The school can be used to apply skills learned in the classroom as well as develop a concept or understanding about some relationship that exists in the ecosystem.

Here are some items to consider in the development of schoolyard E.S.A.

Establish a School Site Committee (Students, Teacher, and Community Ext. - S.C.S., etc., parents).

Construct a map of the school site.
Identify and describe unique characteristics.
Develop a plan of use and alternative use.
Develop a brochure about the school lab.
List plants and plot on map.
Investigate possible sources of plants.
Develop a priority planting plan.
Plant first round of plants.
Establish records and keep procedures.
One-day in-service workshop on use of schoolyard as a learning environment.
(Involve students, teachers, parents.)
Write-up schoolyard environmental investigations (involve students).
Water and maintain plants--summertime.
Plant second round of plants.
Second in-service workshop.
continue: 1. Development of schoolyard.
2. Training sessions (students-teachers).
3. Curriculum development.

Each teacher can involve her class in the inventory of their schoolyard and itemize how they can use it in their teaching situation.

Here are some examples of items to be considered for development for use by students, teachers, PTA, community, etc.

1. Arboretum of Plants

a. Description: An area planted to native plants, trees, shrubs, ground cover plants, ferns, mosses, fungus, lichens. This is a long-term project. The sunloving plants are planted first and as ground shade is produced, shade-loving plants such as ferns, etc., can be added.

b. Possible learning situations: Classifications, identification, economics of plants, growth requirements, develop observational skills, art texture, aesthetics of plants, seasonal changes of plants and animals, studies in plant succession.

c. Location: Corner of schoolyard, area not in mainstream of play yard.

2. Soils Pit

a. Description: A soil pit or bank large enough for several students to get into and conduct studies of soil horizon depth, texture, structure, ph, root penetration. There should be such a pit for each different type of soil in the area. Should be fenced so students can't fall in; consider a roof on the pit for winter use.

b. Possible learning situation: Soil studies related to plant growth requirements, water percolation, what is soil, land capability uses, soil erosion, hazard studies, process of soil making, art assignment of painting texture.

c. Location: Corner of school yard or nearby vacant lot, etc., where good soil profile can be studied safely.

3. Wildlife Habitats

a. Description: Areas along the fence rows, odd corner and even some landscape areas around buildings to be planted to multiflora rose, bitter cherry, mountain ash, india plum, cascara, etc. Will provide aesthetic screening from neighboring houses, protection for birds and color to the school yard.

b. Possible Learning Situation: Classification, identification of wildlife, wildlife habitat, comparing to other, requirements for survival, wildlife found in area, social and economic values of wildlife, an area of social structure with species of wildlife, physical adaptation of wildlife to this environment (do all kinds have same type of bill? Why don't squirrels have canine teeth, etc.?)

c. Location: Along fence row, odd corners in school yard, flower beds, etc.

4. Outdoor Classroom Gathering Place

a. Description: For class to gather informally to study anything. A secluded spot, sheltered from wind and people. Might be a depression in the ground, an amphitheater type. Might have benches, logs, or just grass.

b. Possible learning situation: The class does not have to stay in the four walls of a classroom to study from a text, do a language arts assignment or have a debate. Can be used to enhance writing a Haiku, read a poem, discuss a current problem or do a class assignment.

5. Picnic Area

a. Description: Area under shade trees on or near lawn, or mowed grass area with enough tables so a whole class can enjoy a lunch. Fireplaces can be provided as needed or desired.

b. Possible Learning Situation: Develop proper attitude for use of outdoor environment -- what to do with garbage, papers, etc.; after eating, how to properly build and extinguish campfire and cleanup afterward, social experience of courtesy and sharing the outdoors together, values of recreation facilities, need for proper use of outdoor with more leisure time.

6. Outdoor Environment Laboratory Area

a. Description: (1) An area of land that is in its natural state. This might be a wooded area, a vacant lot of native grass, and other plants, hardwood area, a bog, swamp, etc. The important thing is that it remains in its native state and that man doesn't

tamper with the natural environment. This may be an area ½ to 20 acres or more. (2) An area near the school buildings for students to plant a garden of tree seedlings, flowers, or vegetables in conducting growing plant studies.

b. Possible Learning Situation: Quadrant study of soil, plants, wildlife relationships, studies in plant succession, natural and social history studies of area, wildlife habitat, growth requirements of plants, aesthetics of natural areas.

7. Landscaping of School Grounds

a. Description: Should be accomplished as a part of the overall learning environment plan for entire school property at time school is built. Many native and introduced plants lend themselves to low maintenance costs and maximum aesthetic educational values. Sycamore or sweet gum trees, for example, are fine to plant in front of south and west school room windows to provide shade for bright sunny days thereby cutting glare and heat inside and causing better learning situation.

Provides aesthetic appearance, benefit and credit to community. Beautifies the school grounds and blends buildings to fit the school yard. To reduce classroom glare and solar heat problem, thereby increasing effectiveness of classroom learning environment.

b. Possible Learning Situation: Aesthetics and beauty of our school environment, classification and study of new plants, difference and reason for soil temperature in culturalized flower beds and compacted turf areas. Difference in ornamental plants from native plants. Difference in wildlife found here from other areas. Shade as a factor in temperature change.

c. Location: Entire school grounds.

SAMPLE INVENTORY SHEET TO USE WITH YOUR CLASS IN INVENTORYING YOUR SCHOOL YARD

Part 1. List the different areas on your schoolyard that can lend themselves in providing meaningful learning activities for your students. You can list your areas by location, different plant communities, habitats, etc.

Area	Activities

Part 2. List the specific things you would add to your schoolyard to improve its use as an outdoor classroom (plant wildlife, food plants, develop arboretum, etc.)

Area	Activities

Part 3. Make a sketch or drawing of your schoolyard showing the location of items in No. 1 and where you would put items listed in No. 2.

(Develop land use zoning and planning guidelines for schoolyard and delineate uses on schoolyard sketch map.)

SAMPLE WORKSHEET FOR INTERPRETATIVE STUDY AREA

Area or Station No.	Description of area or Station	Interpretation of Area or Station

SAMPLE WRITE UP FOR AN INTERPRETIVE STOP

Grade level to be used: _____

Description of object: (Rotten log, crowded tree stand, evidence of wildlife, soil pit, etc.)

Interpretation of object: (Discuss the ecological and natural aspects of the subject)

Discussion of subject with students through questions (List questions and investigation in sequence for developing the subject with students)

List areas of curriculum where this activity would apply and give an example.

SAMPLE FORMAT FOR AN E.S.A. PLAN

(Suggested Portland Public School Environmental Study Areas)

Some of the major environmental learning environment has been identified on the enclosed map and a short resume of each follows.

Forest Park. Owned by Portland Park Bureau is located in the west hills of Portland. This 5,000 acre forest is located on typical steep forest land accessible by road and trail. Studies of this forest environment can include: geology, forest soil formation, plant succession, economic and historical significance to Portland, political implications in making it a Forest Park, pollution problem of an urban forest, soil-plant-water relationship, social impact on recreation and leisure time users.

Present educational use includes primary grades observing seasonal changes to sophisticated high school and college experiments in plant succession.

Oaks Bottom, Urban Wetlands. Owned by Portland Park Bureau, as an undeveloped park, it is located at the northeast end of Sellwood Bridge. It is approximately 100 acres in size and is the only wetland area left inside the city suitable for urban wetland ecology studies. All others have been claimed for industrial or developed recreational use which has destroyed all of the wetland characteristics and limited the waterfowl nesting sites. It has the largest population of nesting waterfowl of any area in the city. Studies can include ornithology observation and record keeping, bird banding, records of nesting habits of migrating fowl, study of migratory flyways, international treaties, political action on hunting regulations, bog and wetland plant succession, water hydrology studies, stream overflow and siltation, long term bird blind photography projects and record keeping.

Present educational use includes bird census for scientific reporting journals by high school and college students to waterfowl observation by elementary students.

Johnson Creek Study Area. Owned by the city, this one study area is located at S.E. 39th and Johnson Creek. This is a typical small urban stream that has been polluted by housing and light industry development. Studies can include collecting and interpreting data on water quality, observing, collecting and classifying aquatic life and predicting pollution levels and causes, economics and political action to alleviate that pollution, studies in adequate land use planning and zoning, on going experiments and data collecting of changes in the creek.

Present educational uses include determing stream flow volume by intermediate students to measurement of O_2 and temperature levels by high school students.

Mt. Tabor Park. Owned by the city; it is an extinct volcano developed as a park. It includes a picnic area, ampitheater (in the mouth of the volcano), water reservoirs, horticulture garden, some semi-natural forest areas and commands a sweeping view of Portland. Studies can include: geology (physical and historical), geography (map reading skills including economic and land use patterns of growth), forest and horticultural plants, comparisons of natural and man-developed recreation areas, water reservoirs, water works, watershed etc.

Present educational uses include: map reading, skills by intermediate students to earth science studies in volcano geology by high school students.

Rocky Butte. Owned in part by Multnomah County, it is located on city limits between Portland and Parkrose. It has much the same uses as envisioned at Mt. Tabor. It commands a good view of the Portland Airport, Columbia River and Cascade Mountain range. Studies can include map reading skills, geology of landscape, economic importance of proposed housing development on Rocky Butte, Portland Airport (as an industry, service, and taking agricultural land out of production) rock quarry, deciduous forest environment.

Present educational uses include nature hikes.

Columbia School Farm. Owned by the school district, this land is already being utilized by the schools to involve urban students in important experiences of managing farm land and producing valuable crops. Studies include: horticulture techniques, responsibility for growing and harvesting crops, home economics in preparing and canning food, agricultural and home and business economics, machinery repair, marketing experience, soil-plant relationships, land capability, experiments in flood plains, land values, etc.

Present educational uses encompass much of the above.

Whitaker School - Fresh Water Lakes. Owned partly by the school district and private land owner, this fresh water lake area is the last of its kind in the Portland area. Developed naturally in the flood plan of the Columbia River, these lakes are fed from fresh water springs. There are 40-50 acres of private land surrounding the lake that should be purchased immediately to insure protection from industrial pollution and to allow for a maximum of educational development of the area.

Studies can include comparison of fresh water aquatic life to slough aquatic life and relationship to water quality criteria, ecological comparisons to Johnson Creek, Willamette River and mountain stream in Forest Park, ecological stages in the development and death of a lake, census studies of mammals and birds around the lakes, comparisons of animals with other environmental areas, (Why do you find different waterfowl at Whitaker than at Oaks Bottom, for example?), studies and experiments in reestablishing different animal habitats in and around lakes to bring back a variety of animal life, land use planning and zoning, land development, for proper utilization such as an arboretum, natural plant succession area.

Present educational studies include: collecting data on wood duck nesting sites (only a small number of wood ducks in area) by elementary students to collecting zoo-plankton from bottom by high school students.

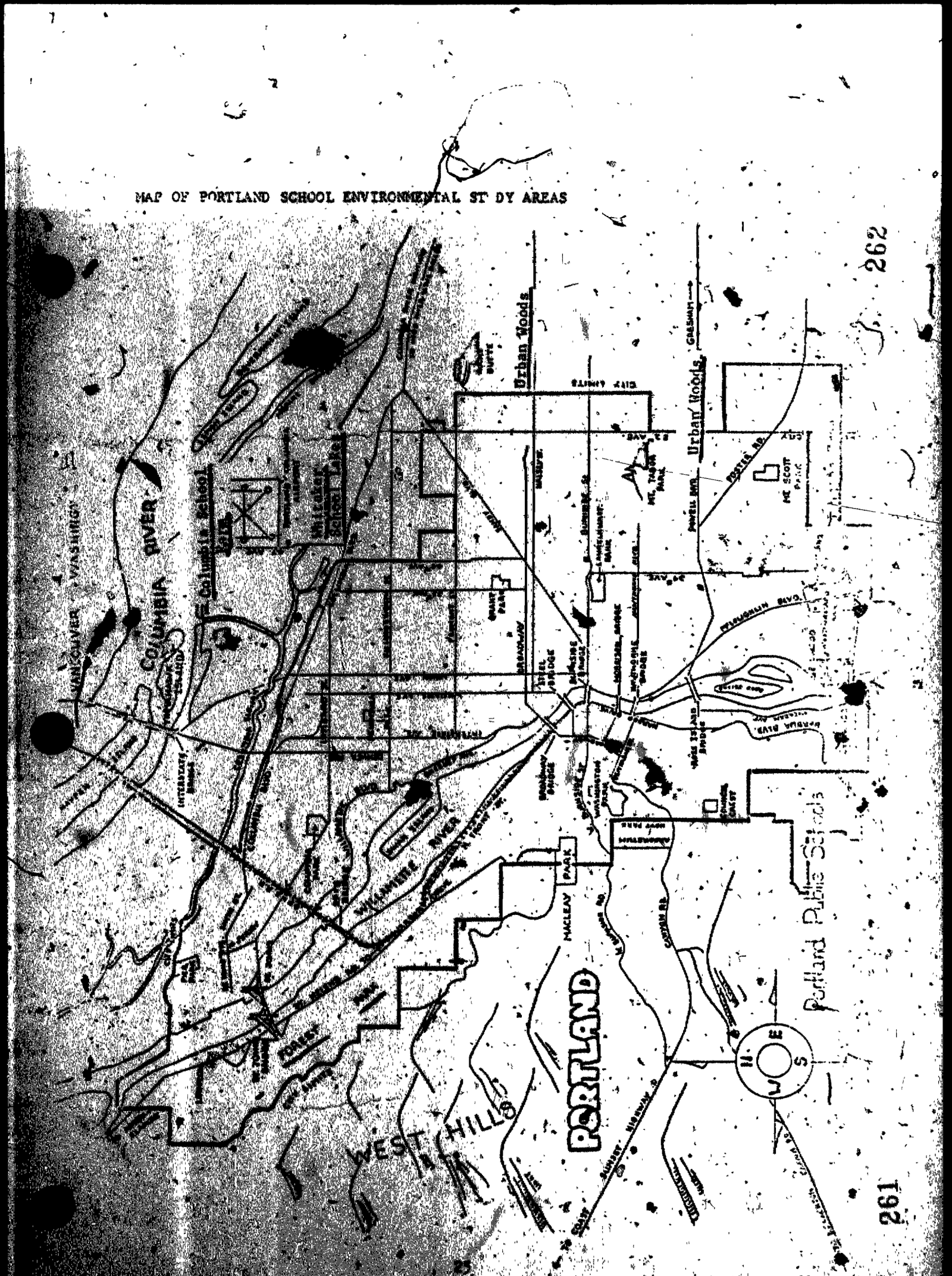
Other Environmental Study Areas (not marked on map)

There are a variety of other environmental study areas and sites available to further enhance the educational process. School yards can be used for experiments in black-top and lawn ecology. (those schools privileged to have a grove of trees or wooded area on or near the schoolyard can engage in types of urban wood ecology studies). Vacant lots, city parks, students backyards,

urban renewal projects, study of old and new architecture, city transportation flow patterns and changes, zoo, O.M.S.I., Western Forestry Center, Rose test gardens, Hoyt arboretum, all must be more fully utilized to involve students in a variety of realistic educational experiences so that they will relate intelligently and positively to their total environment.

As these and other areas are identified as potential environmental study areas, suggested curriculum guidelines, activities and teacher in-service training programs for their use must be developed and scheduled to insure proper and intelligent use.

MAP OF PORTLAND SCHOOL ENVIRONMENTAL ST DY AREAS



ACTION PLANNING FOR A TEACHER WORKSHOP

1. What skills or competencies do teachers in your area need in Environmental Education? Example: Skills in setting up open-ended environmental investigations with students, skills in using Environmental Study Areas, discussion skills in environmental issues.

2. Based on skills and competencies identified, construct a schedule showing what sessions will be conducted.
   Consider length of time,
   number of participants,
   who is available to construct,
   who you need to contact.

A CHECK LIST OF IDEAS FOR E.E., TEACHER TRAINING
(Compiled from Teacher Comments)

Involve community segments to conduct workshops
One-day workshops on school yard
Coordinated effort with other in-service training

Formulate a training team of resource people and educators (minimum 4 people).

Informal contact with educators to gather input into a potential program.

Preliminary informal contact--principal to get a feeling for support and opposition to a program.

Board of Education contact

Individual preliminary contacts
General board meeting with superintendent present

Make initial teacher contact at District orientation session in the fall.

Meet with small groups of teachers for session (possibly during "observation days") staggered during fall to cover all teachers eventually. Not to exceed 10 people/group (principals invited).

Organization of schedule--based on time available. Probably 1 day. Do not overextend (probably 2 sessions, but enough to integrate), and adapt to local situations.

When to hold - before school begins, in-service days, weekends, etc.

Develop a shcedule, format and program for setting up and conducting a one-day teacher workshop.

Schedule

Format

Format

1. Oreientation keynote
   Role playing
2. Instruction in Environmental Investigation
3.

Summary Social Appropriate to the area with facilities

What to teach

Who teaches what. Select resource people and educators for instruction and train them before workshop.

SAMPLES OF ENVIRONMENTAL EDUCATOR WORKSHOP

Objectives

(1) A sample teacher workshop.

As a result of this course, teachers should be able to:

1. Involve their students in environmental investigations using techniques of:
   a. Collecting, recording, interpreting and analyzing data about
   b. Formulating alternative solutions and action plans for environmental problems.
2. Identify areas on the schoolyard and other parts of the community that could be used as environmental study areas and develop materials for their use.
3. Develop instructional materials that strengthen the relationship of existing education programs to environmental education.
4. Explain to key community leaders and group how environmental education helps accomplish the goals of quality education.

A TWO-WEEKEND FORMAT

Friday, March 17	
7:00 - 10:00 p.m.	- Registration, orientation, philosophy, process, approach, classification and observation activities.
Saturday, March 18	(Teachers will be in three groups and rotate) Environmental Field Investigations
8-12:00 a.m.	- Investigations for Land Use Planning, Measuring Some Water Quality
1-5:00 p.m.	- Criteria, Interpreting the Landscape
7-9:00 p.m.	- A Land Use Simulation Game
Sunday, March 19	
8-12:00 a.m.	- Investigations for Land Use Planning, Measuring some Water Quality
1-3:00 p.m.	- Criteria, Interpreting the Landscape.
Friday, April 7	
7-10:00 p.m.	- Planning for the Urban Investigation
Saturday, April 8	
8-3:00 p.m.	- Urban Investigations
3-5:00 p.m.	- Comparing two Environments
7-10:00 p.m.	- Planning and development for selected environmental education programs (E.S.A's outdoor school, simulation).
Sunday, April 9	
8-12:00 a.m.	- Teachers will be divided into three groups and will select one topical area for the day: Observing Environmental Habitats, Mapping the Environment, and Creative Communications.
1-2:00 p.m.	- Environmental Education and the Total Learning Environme

SEVEN-EVENINGS AND TWO-SATURDAY WORKSHOP FORMAT

Wednesday, January 19 7:00 - 10:00 p.m.	- Registration, Problem Solving Process, classification and observation activities
Wednesday, January 26 7:00 - 10:00 p.m.	- Land Use Simulation Game
Wednesday, February 2 7:00 - 10:00 p.m.	- Preparation for Urban Investigation
Saturday, February 5 8:00 - 3:00 p.m.	- Urban Investigation
Wednesday, February 9 7:00 - 10:00 p.m.	- Development of Environmental Study Areas, Environmental Investigation for Primary, Secondary, etc.
Saturday, February 12 8:00 - 3:00 p.m.	- Investigations of a Wetland Environment at Ridgefield Refuge.
Wednesday, February 16 7:00 - 10:00 p.m.	- Micro-Environmental Investigations
Wednesday, February 21 7:00 - 10:00 p.m.	- Comparison of Urban and Forest Environment
Wednesday, March 1 7:00 - 10:00 p.m.	- Curriculum Development in Environmental Investigations

A ONE-DAY "OUTDOOR LABORATORY" WORKSHOP FORMAT

9:00 a.m. - Arrive at area and assemble for orientation to field study. Gather into groups of about 20 each.

9:30 a.m. - Group Study Areas (Study areas would differ to fit the environment.

TIME	I	II	III
9:30-11:00 a.m.	Soils	Plants	Wildlife
11:00-12:30 p.m.	Wildlife	Soils	Plants
12:30-1:30 p.m.	Lunch		
1:30-3:00 p.m.	Plants	Wildlife	Soils
3:00-4:00 p.m.	Evaluation		

1. Form discussion groups by grade level: 1-3, 4-6, 7-8, and 9-12. A discussion leader and recorder will be assigned in each group.
2. Brainstorm the topic "How can we integrate the use and study of this outdoor laboratory into our present classes?"

4:00 p.m. Dismissed

ACTION PLANNING FOR CONSTRUCTING AND INTEGRATING AN ENVIRONMENTAL EDUCATION CURRICULUM INTO THE EXISTING EDUCATIONAL SYSTEM

(Consider identifying objectives, environmental investigations that lead to student developed generalizations, self-oriented task cards, curriculum relationships, group problem solving skills, etc.)

A LIST OF IDEAS FOR E. E. CURRICULUM

(Compiled from Teacher comments)

Process approach

Relate Lesson plan for environmental investigations to man's workload of environment.

Greater emphasis on social science.

More continuity thoughout curriculum and grade levels.

More emphasized simulation.

Meet needs of teachers and kids.

Creative Communication

Explication of higher level thinking abilities.

Direct involvement in community (community education).

Creative student involvement

Kids shouldn't have to hand in everything.

Change life style not technology.

Make an awareness and action a way of life.

Students planning how to use their own neighborhood

Teacher become facilitation for learning (not source of facts).

Change existing priorities.

Be active participants, rather than just textbooks.

Expand existing curriculum to compare local and "now" stuff.

More creative methods for implementing.

Money diverted outside the classroom.

SOME ENVIRONMENTAL EDUCATION CURRICULUM IDEAS AND GUIDELINES FOR ENVIRONMENTAL INVESTIGATIONS

Consider these items in developing and evaluating your environmental investigation. (See Guidelines for Collecting Data for Environmental Problem Solving)

1. Does the activity actually involve the learner in the environment? (Consider the list of Learning Processes below)
2. Is the activity relevant to the learner in his world?
3. Does the activity include opportunities for problem-solving?
4. Does the activity include opportunities for the learner to collect and record data based on his own observations?
5. Does the activity include opportunities for the learner to make his own interpretations about the data he collects?

Two areas for developing environmental investigations include:

Examples Investigating a Specific Problem

Develop detailed instructions for setting up a long-range environmental investigation about a specific topic or problem.

Effect of Soil Temperature on Rate of Plant Growth on the Schoolyard.

Correlation Between Observable Weather Conditions and Local Air Pollution. Index

Year-Long Inventory of Wildlife Habitat Preference on the Schoolyard

Comparison of Different Environments

Develop detailed instructions for setting up an investigation to compare different environments. (Specify whether the study involves the total environment, or whether only parts--soil, water, etc.,--of that environment will be considered.)

Some Examples are:

Comparison of Urban and Rural Environments

Comparison of Terrestrial and Aquatic Environments

Comparison of Schoolyard and City Park Environments
(See - A Lesson Plan for Comparing Two Environments)

The Lesson Plans in "Investigating Your Environment" Series - U.S. Forest Service has many tasks and investigations to assist in Collecting and interpreting data.

SAMPLE OF ENVIRONMENTAL INVESTIGATION ASSIGNMENT FROM A TEACHER WORKSHOP ON ENVIRONMENTAL EDUCATION

A. Describe in writing a project to be used in your teaching situation to inventory, collect and interpret data about some part of the man-made environment in which you live.

1. List procedures in process terms. (See Lesson Plan for a Process Problem Solving Approach to Learning.)

2. Do not use the same content used this weekend. (Soil pit, stream, forest, or plants.)

B. Describe in writing the results of the investigation as done by your students.

Examples:

Correlation of observable weather conditions to air pollution index.
Correlation of man-made sounds to noise pollution.
Effect of signs and billboards on sight pollution.
Effect of architecture on aesthetics.
Impact of local shopping center on community.
Supermarket Survey (packaging, buying habits).
Interpreting the man-made landscape using architectural styles, etc.

FORMAT FOR AN ENVIRONMENTAL EDUCATION CURRICULUM EXERCISE

ACTIVITY:

GENERALIZATION TO DEVELOP:

EQUIPMENT:

STEPS TO ACTIVITY: Put the lesson into 3 categories:

1. The Preparation
2. The Investigation (Data collecting & interpreting)
3. The Followup (Additional data collecting, further interpreting, application to environmental management, etc.)

PERMORMANCE TASKS: State in terms that describe what the learner will be DOING to demonstrate achievement of your objectives.

1.

2.

3.

CURRICULUM RELATIONSHIPS: State how any of these curriculum areas might be a part of your activity.

Social Science (geography, history, economics, sociology/anthropology, political science)

Science/Math

Language/Creative Arts

Other

ECOLOGICAL THEMES: Give at least two examples of how ecological concepts can be developed through the activity. Examples of some concepts are change, diversity, interrelationship, adaptation, etc.

SOME GUIDELEINES FOR DEVELOPING OBJECTIVES OR PERFORMANCE TASKS

1. An objective describes an expected change in the learner's behavior.

2. When the learner has DEMONSTRATED this behavior the objectives has been achieved.

3. An objective is a group of words and symbols which communicate the expectation of the learner so exactly that the others can determine when the learner has achieved it.

4. A meaningful stated objective, then, is one that succeeds in communicating your expectation for the learner.

5. The best objective is the one that excludes the greatest number of possible alternatives to your goal. (No misinterpretation.)

Cromwell Park School, Shoreline, Wash.

ACTION WORDS

Here are nine action words from the American Association for the Advancement of Science that apply to curriculum related activities in the environment. These are not the only usable action words.

Identify - The individual selects a named or described object by pointing to it, touching it, or picking it up.

Name - The individual specifies what an object, event, or relationship is called.

Order - The individual arranges three or more objects or events in a sequence based on a stated property.

Describe - The individual states observable properties sufficient to identify an object, or relationship.

Distinguish - The individual selects an object or event from two or more which might be confused.

Construct - The individual makes a physical object, a drawing or a written or verbal statement (such as an inference, hypothesis, or a test of any of these.)

Demonstrate - The individual performs a sequence of operations necessary to carry out a procedure.

State a Rule - The individual communicates, verbally or in writing, a relationship or principle that could be used to solve a problem or performs a task.

Apply a Rule - The individual derives an answer to a problem by using a stated relationship or principle.

(Notice Performance Tasks listed at end of each Lesson Plan in Investigating your Environment Series.)

Consider these items in evaluating your performance tasks:

1. Have you described the behavior the learner will demonstrate as evidence that he has achieved the performance task?

   Is it a measurable action or performance by the learner? (See list of Action Words)

2. Have you stated the conditions you will impose upon the learner when he is demonstrating his mastery of the performance task?

   Examples:

   using the length of his own step he will demonstrate_____

   given a list of rocks he will distinguish _____

   given a set of tree samples he will construct a dichotomous key_____

   using a highway map of his state he will describe_____

ONE WAY TO SET UP YOUR OBJECTIVE:
INSTRUCTIONAL OBJECTIVE:

What will the learner be DOING?	Write:
What CONDITIONS will be imposed?	
How will success be RECOGNIZED?	

The complete instructional objective should be written below.

CURRICULUM DEVELOPMENT QUESTIONS

(These questions should be used and considered near the end of a course or after the actual environmental investigations and activities have been done.)

1. What processes and methods did you use in your investigations?

2. What other methods and procedures could you have used?

3. If you had more time, what additional information could you collect in your area?

4. What are some "focus words" that could be used to study an area? (change, repetition, continuity, interdependence, etc.)

5. Describe one or two activities that you can do with your students to investigate some part of your community environment.

6. What part of our investigations, that we have done, can be directly replicated with audiences or students in your teaching situations?

ACTION PLANNING FOR PUTTING THE COMPONENT PARTS OF THE PLAN TOGETHER

(Review the parts of the plan--E. E. Committee, E.S.A.'s, Workshops, curriculum, and list the steps, meetings, target dates, projects, etc., needed to implement the plan. Identify individuals and/or groups best qualified to implement various parts of plan.)

MISCELLANEOUS

CREATIVE COMMUNICATIONS IN THE OUTDOOR ENVIRONMENT

The following is a suggested list of activities that could be used in any environment. The activities are designed to help the student sharpen his observation skills and then communicate his perceptions and feelings about the environment to others.

I. ON THE WAY TO THE SPECIFIC AREA:

A. Notice colors that are present.
B. Give the colors descriptive names rather than common names (as if no one had ever determined color words).
C. Stop along the trail and describe several colors as a group.

II. AT THE ACTIVITY SITE:

A. What can you see around you? Discussion.
B. What do you hear? Loudest noise? Smallest sound? etc.
C. What phrases might we use to describe this area? (do a few orally).
   1. Jot down two or so phrases of your own.
   2. Get the group into a semi-circle and have each person read his phrases. Do this in quick order so that they will fit together and sound like one poem.
   3. Change the order of the group so that the phrases written make better sense. Have people form smaller groups and combine their phrases and then read them orally. (Do either of these activities).
D. How can an area such as this dictate mood?
   1. What role does color play in creating this mood?
   2. How might our reaction be different if this area were black and white? Monochromatic?
   3. What are some advantages of color in our environment?
   4. How does color enhance or enrich our environment?
E. Throw away (scatter) art:
   1. Choose one pattern, shape, color, etc. you see and collect several pieces of forest litter that illustrate the pattern, etc. Arrange these pieces in your hand.
   2. Share with the group.
F. Time alone
   1. Environmental interaction is a personal reaction to surroundings. You are to spend the next 45 minutes by yourself. You should select an area that is out of visual range from anyone else. You may sketch, write, or just be alone. (Hand out any materials group members may need.)
   2. After 45 minutes regroup for a discussion:
      a. Feelings?
      b. Reactions?
      c. Share any sketches, poems, etc. that individuals came up with.

III. GROUP PROJECT

A. How does nature communicate with us? (color? shape? location? season? light intensity? shadows? life or lack of it? etc.) Discussion.
B. How might we communicate to others our impressions of, or reactions to, this environment (site)?

C. What are some possible tools for communication? - sketch (natural media), poem (cinquain, Haiku, blank verse, etc.), collage, narrative (poem or prose), map of the area (student made), random thoughts, flat item mounting (forest litter) or maybe a sound recording with slides.

D. For the next 40 to 60 minutes we are going to compile a booklet that will communicate to others our impressions of and reactions to this site. You may work as individuals or in small groups.

IV. FOLLOW-UP DISCUSSION:

A. Examine the outcome of the project. If time allows each participant may want to explain his contribution. (This type of follow-up may not be necessary.) You may want to have everyone look over and enjoy the booklet.

B. If possible, a reproduction of the booklet should be made available to all group members.

Diane Brownfield, Milwaukie, Oregon
3/9/71

A FEW LANGUAGE AND ART ACTIVITIES IN THE OUTDOOR ENVIRONMENT

DEVELOPING A SENSE OF TOUCH

Spend a few minutes exploring a designated environment through the sense of touch.
Write down descriptions of the way things feel.
Share the description with the rest of the group.
Put some of the description phrases together to make a group poem.

DEVELOPING COLOR IMAGES

Introduction to this outdoor activity could begin by reading excerpts from Hailstones and Halibut Bones, or simply by asking questions about color. Green is the example given. Other colors may be substituted. What are green things you can see? What are the sounds of green? How does green feel? What are the tastes of green? What things smell green? Green is the feeling of - - -

WALK TO OBSERVE FOREST INFLUENCES (factors that change the environment)

List the factors observed.

STUDY LOG (last winter's blow-down, a tree that split up the middle, insect damage on log nearby)

List all the things that have changed, and are changing the tree. (Allow 10-15 minutes.
Order these factors the way you think they happened.
Count rings on the sections of the log cut up.
Why is there a difference in the number of rings on sections of the same log?.
Spend 3-5 minutes writing down your thoughts on the above question.
Discuss your ideas.

STUDY SNAGS in the area that have evidence of forest influences. (snag with pileated woodpecker holes, burls, fungi, etc.)

Sketch these trees that show influences and write down ideas you have for possible language activities using these trees.
Sketch snag using natural material and writing cinquain.
Observe evidence of change on snag. Use campfire charcoal (black), rotten wood (brown), elk lichens (green-yellow), bracken fern (green), iodine conk (red).
Sketch on manila paper.

CINQUAIN

Write a cinquain about the snag.
1 word to name subject _____
2 words to describe it _____ _____
3 words of action about it _____ _____ _____
4 word phrase about it (in this case, what this snag means to the rest of the environment) _____ _____ _____ _____
1 word that sums up the subject _____

IMAGES AND HAIKU

Sit on end of dock or other NEAT place.
Write one image or impression for each of the senses.
(imagery or impression is very loosely defined as a "word picture")
_____ words which bring to mind a brief impression of a scene.)
seeing - ripples shifting their position around the lake.
hearing - wind rising and falling through the trees, getting louder and closer and then fading away.
smelling - the smell of pungent pines.
- etc., etc.

Explain technical specification for HAIKU - three lines of
5 syllables
7 syllables
5 syllables
Totaling 17 syllables which give a brief impression of some aspect of nature.
From these images, construct a HAIKU:

"Ripples make their way across
the lake as the wind
whistles through the pines."

OR

Describe the next six sounds you hear --
Which are man-made sounds?
Which are natural sounds?
Which sounds were most pleasing to you?
Did your reaction to the sounds reflect past associations with those sounds?
Write a HAIKU about the sounds and their effect on you.

COMMUNICATION THROUGH CONVERSATION

According to Mother West Wind, animals conversed quite freely with each other. Do animals really communicate? How? Do birds communicate with mammals? Why? Using study skills, create a situation in the outdoors whereby animals might be conversing. Or, perhaps you might come face to face with an animal while on a hike. What would your conversation with that animal be like? Study Skills: punctuation, quotations, capitalization.

RIDDLES

Study the materials on the forest floor. Discuss the implications of the effect of these materials on the forest. Differentiate between natural forest litter and man-made litter. Activity: Review the five senses. Choose an object from the forest floor. Using the five senses, write a riddle describing this object. It may be rhyme or prose. Example: This object is about the size of a small child's fist. It feels something like a scouring sponge, but it smells better than that. It smells like warm straw, and crackles when I squeeze it by my ear. It's sort of yellowish-green. I didn't want to taste it.

EVIDENCE OF WILDLIFE

Walk to pile of cut-up Douglas fir cones.
Why are these here?
Construct a story on evidence found:
What was the squirrel after? Where are the seeds in a cone? How many seeds per bract? How many seeds per Douglas fir cone? (Count several and take average)
Why are there so many cone pieces in one place rather than scattered around?
Follow up any or all of above topics in a written activity.
Use cut-up cone parts in a design to be pasted on 8 x 10 cardboard. Use as many parts of the cone as possible.

MINI-MURAL OF FOREST INFLUENCES

Collect influences (dried materials only - cones, twigs, bark, lichen, soil, etc.)
Glue on 5 x 7 cardboard in a pleasing arrangement.

CARTOON AND LIMERICK (OR CAPTION)

Glue on piece of Ponderosa pine bark on a 5 x 7 cardboard.
Using only a felt pen, sketch in details of a cartoon, using the piece of bark as part of the scene.
Write a limerick to accompany the picture. (Can write a caption for the cartoon instead)

PONDEROSA PINE BARK THING

(Collage, Mosaic, Design, or whatever)
Collect pieces of bark and arrange them, glue on board.

by Charline McDonald, Phyllis Enger, Zee Butler

SOME "AROUND THE SCHOOL YARD" ACTIVITIES

USING THE SENSES

Equipment Needed:

1 sheet of drawing paper (8½ x 11") (manila) per child.
Each child brings one dark crayon (green, black, brown, etc.).
Each adult leader should have a clip-board and paper and pencil.
List as many of the children's comments as possible for each activity.

Tell the children you are writing down their descriptions.

At intervals throughout the activity, read back their comments to them.

At the end of each activity, read what was said as a summary.

Group leaders should give the comments and descriptions to the teachers at the end of the field trip for use back at school to make experience charts and story-writing.

"Sound" Hike - (10-15 minutes)

Group leader takes kids for walk.

Stop at intervals along the way. Have kids close eyes and listen for 30 seconds. At the end of 30 seconds, kids describe a sound they heard.

(Group leader should write down the way each kid described his sound.)

Try to stop in different places so there will be a variety of sounds to be heard.

See how many different sounds your group can discover.

Ask: Which sound did you like best?
Why?
Does it remind you of something else?
Which sound is the loudest? The quietest? The highest? The lowest?

Mini-Forest - (Approximately 15 minutes)
(Investigating an Arm-Circle of Grass)

1. Lie on the ground, face down.
2. Make a circle by stretching your arms out in front of you on the ground.
3. Find at least five different plants inside that circle made with your arms.
4. See if you can find any tiny animals crawling through the grass.
5. What else do you see? (Any dead leaves or twigs?)
6. Spread the grass apart and describe what you see.

Big Idea - Many plants and animals live together in a community.

Sketching - (15-20 minutes)

Find two trees with different shapes. Observe and sketch one tree at a time.

1. Look at the tree from a distance.
2. With your finger, "trace" (in the air) the shape of the tree. (Do this from the ground up to top and from top down to ground.)
3. Describe the shape of the tree.
4. Make a "telescope" with your hands. Look through this "telescope" at your tree from a distance.
5. Describe how the branches go out from the trunk. (Up? Out? Down?)
6. Hold out your arms to show how the branches grow out from the tree trunk.
7. Go closer to the tree. What else do you notice about it?
8. Get close to the trunk of the tree. Look up into the tree. What do you see?
9. Go to a comfortable place where you can see your tree. Sketch it with the crayon you brought.
10. Repeat procedure for second tree.

Add some of nature's color to your sketch.

Pick some grass. Use it as a crayon. Rub it around on the paper to show where the green is on your tree.

Pick a yellow dandelion blosson. Use it as a crayon somewhere on your sketch.

"Touch and Feel" Hike - (Approximately 10-15 minutes)

Group leader takes kids for a walk. Gives following directions at intervals along the walk. (Add others when appropriate.)

1. Find the hairiest leaf around. Bring back a tiny bit of it. Compare with your other group members.
2. Find the softest leaf.
3. Find the smoothest rock.
4. Find the roughest twig.
5. Find something cool.
6. Find something warm.
7. Find something bumpy.
8. Find something dry.

"Color" Hike

1. Look for things that are different colors of green. Bring back three or four green things.

   Arrange them in your hand according to lightest green to darkest green.

2. Find and describe things that are:

   yellow-pink-brown-grey.

MATH MEASUREMENT

Determine length of step. Use this unit of measurement for:

Calculate perimeters and areas of schoolyard activity spaces (playfield, ball diamonds, open fields, etc.). Convert measurements to yards, meters.

Construct a conversion scale for metric measurements using the length of your step.

Find out how many times you need to run around the playfield to run a mile.

Find out how many acres are on your playfield.

Construct a map of the schoolyard using the plane table method.
Map to scale.
(Use Boy Scout Merit Badge Series on Surveying as a reference.)

Determine heights of trees, utility poles on or adjacent to schoolyards, using triangulation and a stick at least as long as your arm.

Compute cubic volume of trees and utility poles using above method.

Determine percentages of slope of land using a yardstick, another stick, a baby food jar half filled with water.

Construct a topographic model of your schoolyard using layers of cardboard.

Learn to use compass and determine cardinal directions on schoolyard. Orient map and compass to actual landscape from schoolyard.

Learn to use instant mapper and use it with the compass.

Observe and sketch geometric shapes seen on schoolyard or adjacent areas. (Find triangles, circles, rectangles, squares, lines, etc.)

THINGS TO DO WITH TREES

Observe and compare the shapes of trees.

How many shapes can you find?
Discuss the shapes. Is it triangular? Like a column? Evenly tapered? Low and spreading? Regular? Irregular?
Find two trees with distinctly different shapes and sketch them.
Look for different shapes of trees on the horizon.

Observe and compare the branching of trees.

How many different directions do trees branch?
How do the branches grow out from the tree? Straight out? Out and then down? Out and then up at the ends?

Find two trees whose branches grow differently and sketch just the way the branches grow.
Write a comparison about the differences in branching of these trees.

Observe and compare the foliage of trees.

How many different textures of foliage do you observe?
Do the leaves grow up from the branches? Or do they grow down?
Do the leaves grow all along the branch, or only at the ends?
Do the leaves hide part of the branch?
Find two trees with different textures and sketch your impression of the textures.

Observe and compare the colors in trees.

How many different colors can you find in the trees?

Observe one tree at various times of a sunny day and compare the light patterns.

Observe, sketch, or photograph the designs and patterns made by the shadows of trees.

Observe and compare the bark of trees.

How many different textures can you find?
Make bark rubbings with newsprint and crayon.

How do trees enhance the environment of your schoolyard?

WEED PATCHES

1. Look for the different colors of the plants. Arrange the colors in a list -- lightest to darkest:

_____ _____ _____

_____ _____ _____

2. Count and record the different kinds of plants that are below your knees: _____
   a. How many plants have few leaves? _____
   b. How many plants have many leaves? _____
   c. How many kinds of plants are stickery? _____
   d. Do any of the plants have flowers? _____
      List the colors of the flowers:

      _____

   e. Do any of the plants have seed pods? _____
      Describe the different pods: _____

      _____

3. Now record the same data for the plants that are above your knees:
   a. Number of different kinds: _____
   b. Plants with many leaves? _____
   c. Plants with few leaves? _____
   d. Plants that are stickery? _____
   e. Do any of these plants have flowers? _____
      List the colors of the flowers:

      _____

   f. Do any of these plants have seed pods? _____
      Describe the seed pods: _____

      _____

Are there any plants higher than your head? _____
Are there many, or just a few? _____
Describe these plants: _____

_____

5. On a separate piece of paper, choose one of the following to do:
   a. Choose one weed and write a riddle about it, using four of the five senses to describe it.
      Which of our five senses would you not use? _____
   b. Write a poem describing the weed, or a poem telling about the color "green."
   c. Write an imaginary story explaining how the tallest weed became so tall.

INTERPRETING CULTURAL HISTORY AROUND SCHOOL

Inventory building structures within a given distance from your school.

Develop a classification system for types of buildings. (Shape, roof shape, and type, materials in construction, etc.)

Develop a means of classification for age of buildings.

Map the vacant buildings within a given distance of your school.

Determine how long buildings have been vacant. (Observe deterioration, interview local residents, consult written records, etc.)

What function did the building perform when it was in use?

What factors caused the building to become vacant?

Who owns the building now? Is there another possible use for the building?

Make an inventory of fences within a given distance of your school.

What different types did you find?

What different materials have been used in the fences?

Develop a classification system for the fences you observed.

Develop a chart showing the type of fences and their most common uses.

If possible, find pieces of discarded fences and construct a board of these, listing uses for each.

Use aerial photo to locate section corners in your area. If possible, go to that location and look for a witness tree. See if scribing is identifiable.

Locate the watershed in which your school is located. What land uses are in that watershed?

Locate the source of your community's water supply. What changes have occurred in the water supply situation in your community?

Char McDonald and Zae Butler 5/70

EQUIPMENT LIST

This is a basic list of materials needed when planning a Forest Service Environmental Education Workshop. Most of these items should be ordered at least 4 weeks prior to session in order to insure delivery.
(Approximate cost of initiating first workshop - $250)

Quantity	Equipment Item	Source	Unit Cost	Total Cost
30	Compass, Silva Pathfinder	Don Ratliffe 4930 Country Club Way Corvallis, Oregon 97330	$ 2.00 ea	$60.00
1	100' tape	Hardware store	5.00 ea	5.00
2	Laboratory thermometer, water 30-120° F. pocket testing in metal case	Instrument Service Co. P.O. Box 5048 Denver, Colorado 80217	9.25 ea	18.50
2	Soil thermometer 0-220 F. 6"-spike stem, 1 1/2" dial	ditto	8.77 ea	17.54
10	Pocket Soil ph Kit	Van Waters & Rogers 4300 Holly Denver, Colorado 80216	2.25 ea	22.50
1,000	1 1/2 oz. jelley cups with lids	Wholesale Fountain Co. 936 SE Clay Street Portland, Oregon 97214	10.00/M	10.00
1	Water Test Kit - Model CH-10 O_2CO_2ph	Hach Chemical Co. P.O. Box 907 713 South Duff Ames, Iowa 50010	28.50 ea	28.50
1	Increment borer - 12"	Forestry Suppliers, Inc. Box 8397 205 West Rankin Street Jackson, Mississippi 39204	40.75 ea	40.75
10	6' cloth sewing tapes (diameter tapes)	Dime store	.10 ea	1.00
30	Green bamboo garden stakes (measure height)	Garden store	.50 bdle	.50
30	Hand lens - 8X w/neck cords	Oregon Museum of Science and Industry 4015 SW Canyon Road Portland, Oregon 97221	1.40 ea	42.00
1	Shovel			
1	Hatchet			
20	Wooden stakes for compass game			