FINDING CUBIC FEET OF WATER PER SECOND

OBJECTIVE: - To use match skills to determine how much water is flowing per second.

TIME: - 20 minutes

SEASON: - Any

LOCATION: - stream, river

MATERIALS: - paper and pencils

PROCEDURE:

Find the width, depth, and velocity of a stream or river.

Multiply the average width, depth and the number of feet a stick floats in each second together. This will tell you the number of cubic feet of water flowing in the stream every second.

Extend this activity by asking students to compute the amount of water flowing in a minute, hour, or day.

NOTE: A cubic foot of water is water in a container 1 foot wide, 1 foot high, and 1 foot long--like a huge ice cube.

average width x average depth x feet/second = cubic feet of water flowing per second

STREAMFLOW

OBJECTIVE: - To use math skills to predict how many people could live off a stream

TIME: - 1 hour

SEASON: - Any

LOCATION: - Stream

MATERIALS: - Ruler, paper and pencils

PROCEDURE:

To find the cubic feet of water flowing per second you will first need to compute the average width, velocity in feet per second, and average depth.

A. To find cubic feet of water/second:

average width x average depth x velocity (feet/sec.)

B. How many gallons of water flow in the stream every second?

stream flow in cu. ft./sec. x 7.48 gal./cu. ft. water = gallons of water per second

C. How many gallons flow every minute?

gallons/sec. x 60 sec./min. = gallons/minute

D. Each person uses about 150 gallons of water per day. How many people could live off this stream?

$\frac{\text{gallons}}{\text{minute}} \times \frac{\text{minutes}}{\text{day}} = \frac{\text{gallons}}{\text{day}}$ 150 = people who could live

E. How many gallons of water flow in an hour? A day? A week?

STREAM MEASUREMENTS

OBJECTIVES: - Students will be able to identify and list the variables which must be measured to work out the rate of flow of a stream.

- Students will be able to measure a stream and estimate the number of people the stream could support (domestic use of water only).

CONCEPTS: - Man has many needs for water.
- Everything is going somewhere.
- There is no free lunch.

TIME: - 30-40 minutes

LOCATION: - A stream

SEASON: - Late fall, winter or early spring

NUMBER: - 8

MATERIALS: - 20 feet of twine, a watch/group
Small notebook, pen/student
Task card/group
Tape measure
Calculator ?

PROCEDURE:

Questions and discussion

Brainstorming--What do we use water for in the home?

How many gallons a day do you think that adds up to?

Estimate how many people could live off the stream. Write down your guess.

What information do we need in order to work out how much water flows down this stream?
Speed Width Depth of the water.

Divide the group into pairs and give each a task card.

Allow the students to work out their means of measurement given the instructions on the card.

As the students work, interact among them, helping those that need it by providing them with appropriate clues.

Ask questions such as--What can you use instead of a twig?
Why throw it upstream before you time it?

Use each group's average score as your own raw data and then work out your answers on your notepad.

When each pair has finished collecting their data, bring the group together and work out how many people step-by-step (the math can get involved with large numbers).

How did your prediction compare with your measurement?

How important is this stream to the environment here?

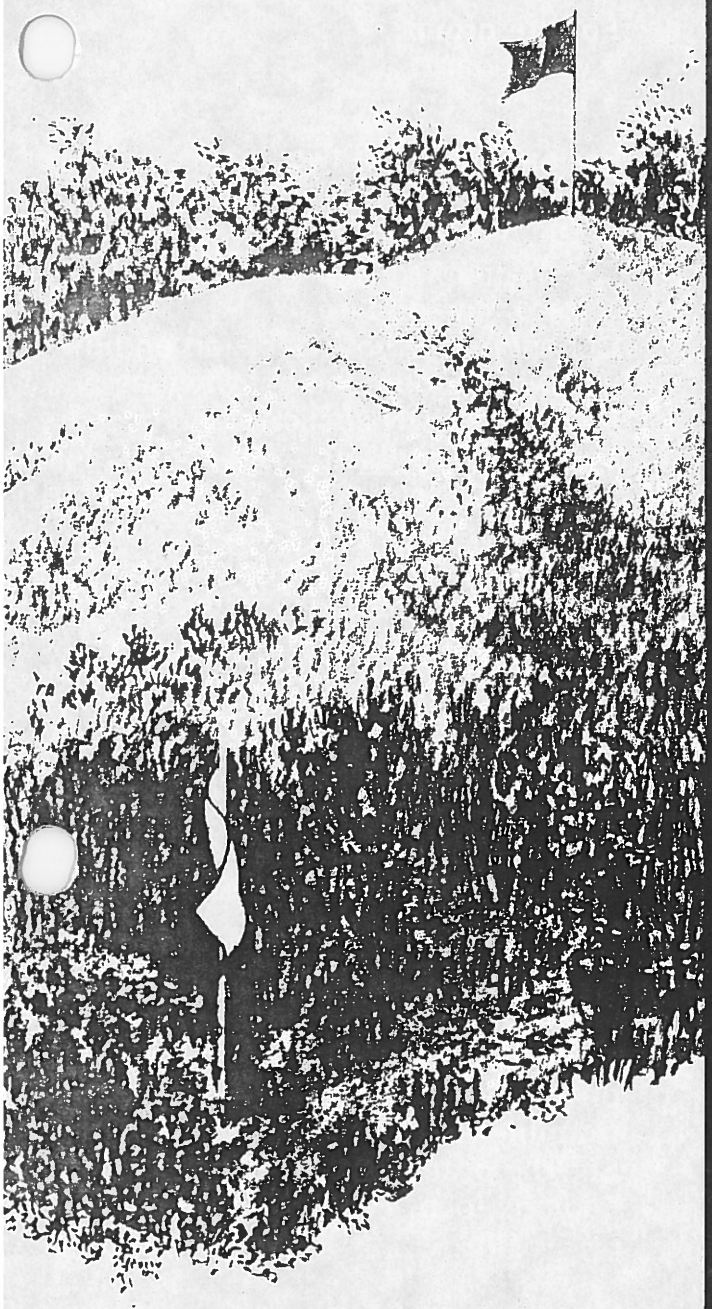
What would happen to this area and downstream if we piped away all the water from this point?

If we were going to use just some of the water, how much should we leave to flow downstream?

SAFETY: - Is the stream safe? Is there a safe place to cross it?

SOURCE: - Adapted from the University of Oregon RPM student file by Gary Belder. The attached task card, when folded, fits onto a 5x8 inch index card.

TERRESTRIAL HI-LO HUNT



The suitability of a habitat to support the life of any particular organism is determined by factors such as temperature, moisture, wind, and light. These factors, which do not remain constant, but change in daily and seasonal patterns in any one location, are called **environmental variables.**

At any one time, a single environmental variable is usually not uniform in an area. The top of a hill might be windy, while at the same time, at the foot of the hill, the air may be calm.

An open, grassy area might be warm and dry from the sun, while just a few meters away, in the shade of a tree, it may be cool and moist.

Different values of environmental variables create different living conditions for plants and animals. Various organisms living in the same general area may exist under drastically different conditions due to variations in their "micro" (little) climate.

Searching out the locations of highest and lowest values for several environmental variables can prepare youngsters to investigate relationships between living organisms and their environment.

INVESTIGATE THE EXTREMES OF ENVIRONMENTAL VARIABLES IN A STUDY SITE: FIND THE LOCATIONS THAT ARE WARMEST, COOLEST, BRIGHTEST, DARKEST, WINDIEST, CALMEST, FLATTEST, AND STEEPEST.

PREPARATION

Read through the equipment cards listed under the **MATERIALS FOR THE HUNT** section and the activity text to determine the materials you will need for the environmental variables the children will be investigating. You may decide to investigate temperature, wind, and slope, but not the others. Thus you could ignore the photographic materials.

Construction of the instruments for the Hi-Lo Hunt can be an activity in itself. If you have time and wish to do so, duplicate all the equipment cards and have the youngsters prepare the instruments they will be using. This construction will take approximately one hour.

Make an overview map on your data board.

MATERIALS FOR THE HUNT:

For the group:
1 data board
1 felt pen

For each team of two:
1 pencil
2 Hi-Lo markers (1 stake with 3" x 5" card marked Hi and 1 stick with card marked Lo)

Depending on your decision on how you will conduct the activity (see **PREPARATION** section), one or more equipment cards and listed materials will be necessary. Listed below are the equipment cards necessary for the topics you decide to investigate. Equipment cards are located in the *OBIS Toolbox* folio.

Equipment Cards
"Measuring Slope"
"Measuring Wind Direction and Speed"
"Measuring Light"
Measuring temperature: no equipment card. Provide thermometers.

Note: Certain hard-to-get items listed on the equipment cards are available from the Lawrence Hall of Science. See the order form in the *OBIS Toolbox* folio.

THE HUNT

1. Point out the boundaries of the study site to the group.
2. Introduce The Hunt. Tell the youngsters they are going Hi-Lo Hunting. "Can you find the warmest and coolest, the brightest and darkest, the steepest and flattest, and the windiest and calmest spots in this site?
3. Divide the group into teams of two to four and either designate or let each team choose the factor (light, wind, temperature, or slope) it will investigate. (If the group participated in the construction of the equipment, this decision has probably been made already.)
4. Distribute two markers to each team for marking the spots where the highest and lowest measurements are taken. Each team should print the variable it is testing on the two cards.
5. Hand each team the appropriate measuring device, **Action Card**, and a pencil. If the teams aren't already familiar with the Hi-Lo measuring devices, demonstrate each piece of equipment before handing it out.
6. Let the Hunt begin! Encourage the teams to take six or more measurements each in their hunt for Hi-Lo values.

AFTER THE HUNT

When all the teams have finished taking measurements and have set out their Hi-Lo markers, call the teams together and visit each of the Hi-Lo markers in the site. As the group moves from one marker to another, raise the following questions.

1. What features of this spot might explain why this is the *darkest* (insert appropriate term) place in this site?
2. Do any of the Hi-Lo measurements seem to relate to each other? For example, do the coolest spots also seem to be the darkest spots? Are the warmest spots also the brightest spots?
3. Will the warmest and coolest spots in the study area always be the warmest and coolest? How about the other measurements?
4. How might the direction of the wind cause some spots to be windy and others calm?
5. How might the time of day change the Hi-Lo measurements? The time of year?
6. Tell the group that physical factors, such as temperature, wind, light, and slope, that may change from minute to minute, day to day, or month to month, are called **environmental variables**.
7. In what ways do environmental variables affect man and other organisms?
8. In what ways does man affect environmental variables?

FOLLOW THROUGH

1. For an interesting comparison, conduct the activity again at a different time of day, on another day, or during a different season.
2. Measure the changes which occur from early morning through late evening.
3. Select a site with different characteristics (ask the group to describe the differences) and compare the environmental variables of the two sites. If you have just studied a lawn, you might want to try a dense woody area, bare soil, pavement, or a meadow.

WHAT TO DO NEXT

Aquatic Hi-Lo Hunt
ESP–Environmental Sensory Perception
Plants Around a Building

Outdoor Biology Instructional Strategies
Lawrence Hall of Science
University of California
Berkeley California

Supported by a Grant from the National Science Foundation

Equipment Card
MEASURING WIND DIRECTION AND SPEED

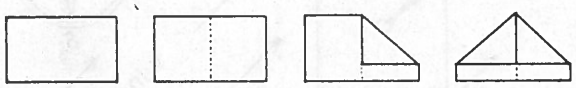
Outdoor Biology Instructional Strategies

MATERIALS FOR ONE WIND STATION:

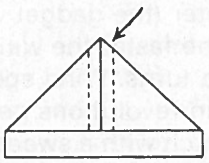
2 nails (16 penny)
1 or 2 cardboard bases (three thicknesses of cardboard glued together, at least 10 cm. by 10 cm.)
2 pieces of plastic soda straw (6 cm. long)
1 piece of heavy duty aluminum foil (15 cm. by 2 cm.)
1 roll scotch tape
1 magnetic compass
1 pair of scissors
1 marking pen
1 tube of glue
1 watch with second hand
4 3" x 5" index cards
1 stapler
1 square of cardboard (6 cm. by 6 cm.)

CONSTRUCTION OF WIND SPEED MEASURER

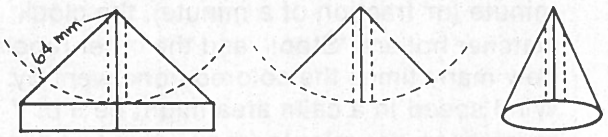
1. Make 4 cones as follows:
   Take a 3" x 5" card and fold it like this:



Tape it here with scotch tape:

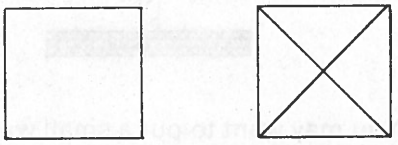


Cut on a curve like this:

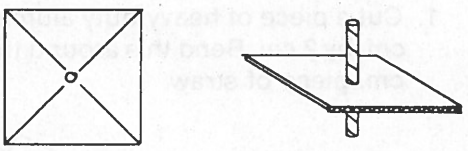


Open the cone, and make three more.

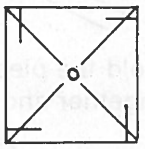
2. Construct your cone holder as follows:
   Cut 6 cm. cardboard square and draw two diagonal lines.



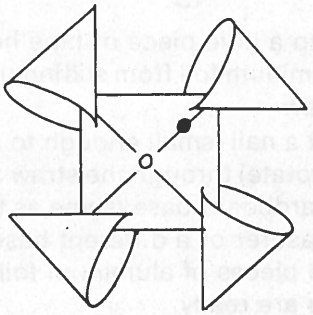
Where the two diagonals intersect, poke a hole with your nail and enlarge it until your straw segment fits snugly in the hole.



Cut four slots in the cone holder like this (cut in 1-2 centimeters):



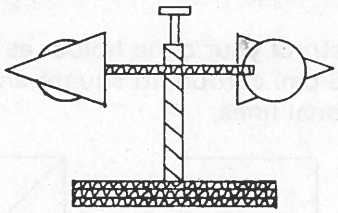
3. Assemble the apparatus:
   Slide a cone into each slot. Be sure they all face the same direction (clockwise or counterclockwise).



Put a reference mark on the cone holder near one of the cones to help you count revolutions.

Make your base by gluing three thicknesses of cardboard together.

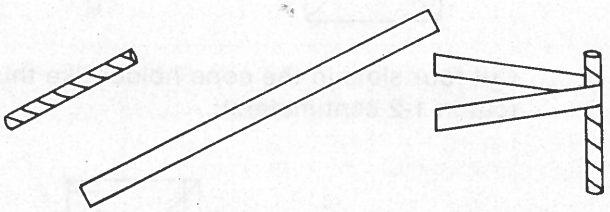
Run a nail through the straw and stab it into the cardboard base.



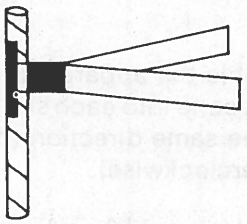
You may want to put a small washer here if you have one.

CONSTRUCTION OF WIND VANE
(for measuring wind direction)

1. Cut a piece of heavy-duty aluminum foil 15 cm. by 2 cm. Bend this around the second 6 cm. piece of straw.

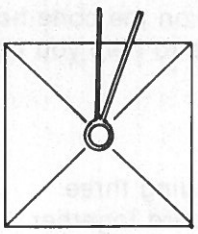


2. Fold the pieces of aluminum foil tightly together and tape them near the straw.

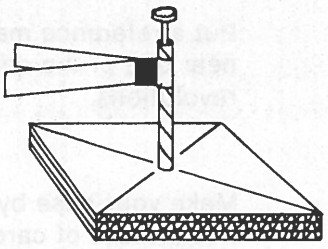


Slap a little piece of tape here to keep the aluminum foil from sliding up and down the straw.

3. Put a nail (small enough to allow the straw to rotate) through the straw and push it into a cardboard base (same as the wind speed measurer or a different base). Spread the two pieces of aluminum foil slightly, and you are ready.



top view

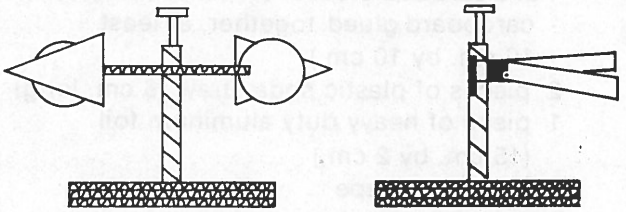


side view

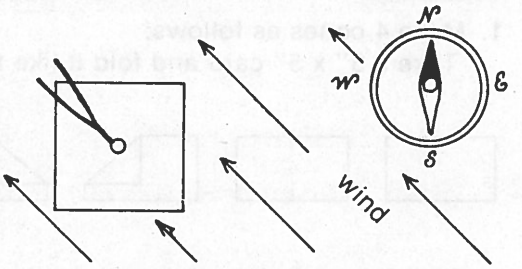
Outdoor Biology Instructional Strategies

USING YOUR WIND STATION

With these two pieces of equipment you can measure direction and speed of wind.



Wind direction is measured with your wind vane. Place it in the wind and note the direction the aluminum foil swings. Winds are named for the direction they come *from*. A wind blowing *from* the north is a north wind. You will want to use a compass if you have one to help you determine directions. This is a south-east wind:



Wind speed is determined using an anemometer (the gadget with the four paper cones). The faster the wind blows, the faster the device turns. Wind speeds should be reported in revolutions per minute. (You will need a watch with a sweep second hand.) Set the wind speed meter in the location that you want to measure wind speed, get the watch ready, and holler "Go!"). One person watches the second hand while the other counts how many times the colored cone goes by. After a minute (or fraction of a minute), the clock watcher hollers "Stop!" and the other reports how many times the colored cone went by. Wind speed in a calm area might be 6 or 7 revolutions per minute (rpm) while fast wind might be in excess of 100 rpm's.

Equipment Card

Measuring Slope

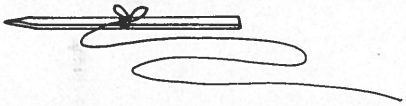
Outdoor Biology Instructional Strategies

MATERIALS FOR SLOPE-MEASURING DEVICE

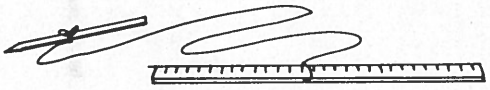
1 meter stick
1 125 cm. piece of strong cord
1 25 cm. sharpened stick
1 level tube (test tube and cork)*
household ammonia
water
tape

Slope can be determined by fixing an anchor point at the upper part of the slope, drawing the one meter cord taut, sliding it up or down until the cord is level, and reading slope directly in cm/meter. Assemble the apparatus like this:

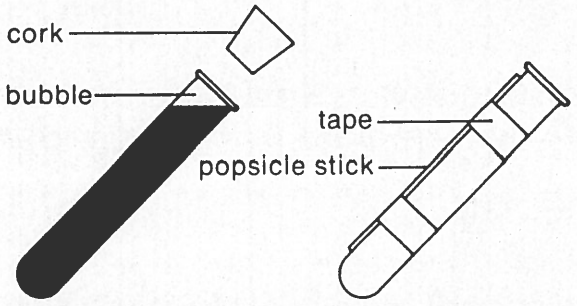
1. Sharpen the 25 cm. stick and fasten the cord to it with a knot which can slide up and down the stick.



2. Attach the free end of the cord to the meter stick so that the distance between the two sticks is one meter, and the cord can slide on the meter stick. You can mark off centimeters on any stick if you do not have a meter stick.

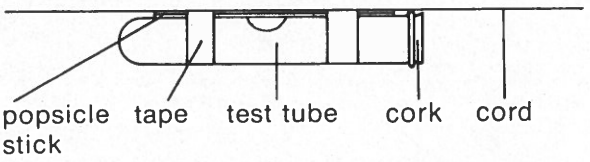


3. Make your level. Fill the test tube almost full of water and add a drop of ammonia. Cork the tube so that a small bubble remains. Trim off top of cork. If your test tube has a flared lip at the top, tape a popsicle stick to the side of the tube before taping the level tube to the center of the cord.

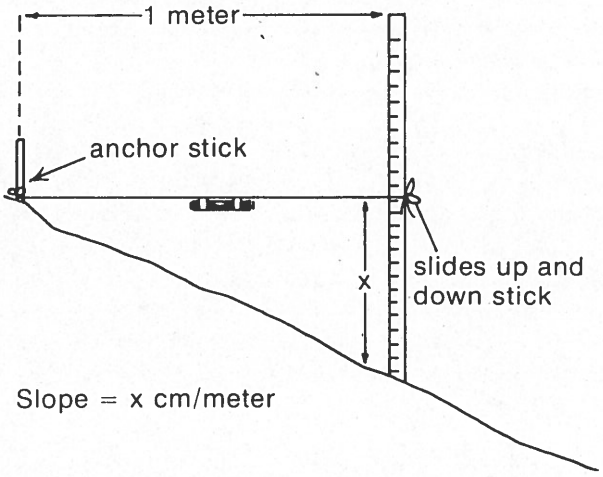


*A little bubble called a line level is available at hardware stores or may be purchased from the Lawrence Hall of Science. See the order form in the *OBIS Toolbox* folio.

Your level should look like this:



4. Assemble all pieces and use like this:



Slope = x cm/meter

Equipment Card

Measuring Slope

MATERIALS FOR SLOPE-MEASURING DEVICE

- 1 meter stick
- 1 125 cm. piece of strong cord
- 1 25 cm. sharpened stick
- 1 level tube (test tube and cork)
- bouncehold ammonia
- water
- tape

Slope can be determined by fixing an anchor point at the upper part of the slope, drawing the one meter cord taut, sliding it up or down until the cord is level, and reading slope directly in cm./meter. Assemble the apparatus like this:

1. Sharpen the 25 cm. stick and fasten the cord to it with a knot which can slide up and down the stick.

2. Attach the free end of the cord to the meter stick so that the distance between the two sticks is one meter, and the cord can slide on the meter stick. You can mark off centimeters on any stick if you do not have a meter stick.

3. Make your level. Fill the test tube almost full of water and add a drop of ammonia. Cork the tube so that a small bubble remains. Trim off top of cork if your test tube has a flared lip at the top, tape a popsicle stick to the side of the tube before taping the level tube to the center of the cord.

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Your level should look like this:

4. Assemble all pieces and use like this:

Action Card
TERRESTRIAL HI-LO

Temperature. Use a thermometer to find the warmest and coolest spots in this site.

Temp. °C	Location
1.	
2.	
3.	
4.	
5.	
6.	

After you have finished taking temperature measurements, mark the warmest and coolest spots with your Hi-Lo markers.

Action Card
TERRESTRIAL HI-LO

Wind. Use your wind station to find the windiest and calmest spots in this site.

Wind Speed (rev/min)	Location
1.	
2.	
3.	
4.	
5.	
6.	

After you have finished taking wind measurements, mark the windiest and calmest spots with your Hi-Lo markers.

Action Card
TERRESTRIAL HI-LO

Slope. Use a slope-measuring device to find the steepest and flattest spots in this site.

Slope (cm/meter)	Location
1.	
2.	
3.	
4.	
5.	
6.	

After you have finished taking slope measurements, mark the steepest and flattest spots with your Hi-Lo markers.

Action Card
TERRESTRIAL HI-LO

Light. Use a light-measuring station to find the brightest and darkest spots in this site. (Remember: the darker the proof paper the brighter the spot.) Write the location of each exposure above each piece of proof paper.

After you have finished taking light measurements, mark the brightest and darkest spots with your Hi-Lo markers.

THE THICKET GAME

Objectives
Students will be able to: 1) define adaptation in animals; and 2) generalize that all animals make some adaptations in order to survive.

Method
Students become "predator" and "prey" in a version of "hide and seek."

Background
Animals are adapted to their environment in order to survive. Animals may be adapted to changes in their habitats. For example, snowshoe rabbits have a white winter coat to blend with a snowy environment and a tan summer coat to blend with summer ground and vegetation colors. Chameleons change color to blend with their surroundings. The walking-stick insect can look like a twig or stick. Fawns have spotted hair that resembles dappled light on the forest floor.

The major purpose of this activity is for students to understand the importance of adaptation to animals.

NOTE: See "Seeing is Believing" and "Surprise Terrarium" for other elementary-age adaptation activities.

Materials
blindfolds; outdoor area like a thicket or other vegetated area where students can safely hide

Procedure
1. Take the class to a "thicket."
2. Blindfold one student who will be the "predator." The predator counts to 15 slowly while the others hide. The students hiding must be able to see the predator all the time.
3. After counting, the predator removes the blindfold and looks for "prey." The predator can turn around, squat, and stand on tip-toes—but not walk or change location. The predator should see how many students he or she can find, identify them out loud and describe where they are. When identified, they come to the predator because they have been "eaten." These prey now become predators.
4. When the original predator cannot see any more students, all the predators now put on blindfolds. The original predator counts aloud to ten. All the remaining prey are to move in closer, but still try to be "safe" and hidden. All the predators remove their blindfolds and take turns naming students they can see.
5. Repeat the process if several students are still hidden. When only one or two are left hidden,

Age: Grades K-6
Subjects: Science, Physical Education, Language Arts
Skills: analysis, application, description, discussion, generalization, kinesthetic concept development, observation, psychomotor development
Duration: 30 minutes
Group Size: minimum of five students
Setting: outdoors
Curriculum Framework Reference: III.D., III.D.1., III.D.2.
Key Vocabulary: adaptation, predator, prey

have them stand up and identify themselves; it may be surprising how close these prey were to the predators—an example of successful adaptation because of how well they blend with their environment in order to survive. Introduce the term "adaptation."

6. Play the game again one or two times.

7. Discuss what would have made it easier to be the last one or get very close to the predators. Some ideas that may come out are: changing color (clothes); wearing clothing that doesn't stick to plants; being of smaller size; climbing a tree.

8. Ask the students to summarize what they have learned. See if the students can think of other examples of adaptation in animals. Generalize that all animals are adapted to survive.

Evaluation

Describe the importance of adaptation to animals. Give at least two examples of animal adaptation.

TUNING IN THE SENSES

OBJECTIVE:
- The participant will be able to concentrate on using and developing one sense at a time.
- The participant will be able to explore and identify five different smells within the environment.
- The participant will be able to find and describe natural objects of a specific size.
- The participant will be able to listen to and describe sounds using analogies and imagination.

CONCEPT:
- To provide an opportunity for the concentrated use and development of each of the five senses.
- To increase participants' awareness of the value of using all five senses as tools for observation.

TIME:
- 1 hour and 30 minutes.

REASON:
- Any -- during dry weather.

LOCATION:
- Anywhere in the outdoors -- preferably a level surface nearby.

NUMBER:
- One to five groups with maximum five participants in each.
- One leader per group. (staff)

MATERIALS:
- paper (2-5 sheets per person)
  pencils (one per person)
  tape (scotch/masking)
  blindfolds (one per person)
  five rings
  natural objects: rocks, flowers, pinecones
  optional: table/bench - flat surface, etc. (3' x 6')

PROCEDURE:

- Arrange five stations around tables or spaced out in an open area.
- Divide participants into groups -- (five max. -- for each station).
- A leader at each station involves the participants in activities oriented toward a particular sense.
- After 15-20 minutes, the leader rotates stations and leads the same activity at the next station. *Alternative: the leader and group rotate together to each station.
- Continue until all groups have participated in each of the five sense activities.

1. Five smells: Ask participants to explore and bring back five different "smells" (soil, flower, fungi, pinecones, etc.). List description of each smell, if desired tape items on a piece of paper.
2. Seeing: Ask participants to find and describe (color, shape, design, etc.) objects of a specific size (pass out rings of various sizes -- "find an item that fits through each").
3. Touch and Feel: Ask group to find and draw or describe:
   a) the hairiest leaf around
   b) the softest leaf
   c) the smoothest twig
   d) the roughest twig
   e) something cool
   f) something warm
   g) something bumpy
   h) something dry
4. Listen: The leader uses natural objects (rocks, leaves, cones, etc.) to make sounds for the participants (but keeping the objects from their sight).

   Participants close their eyes (blindfolded) as each sound is made and then try to describe it using analogies and imagination. Each description is written on paper.

   After the activity is completed, discuss descriptions and/or tape descriptions next to each object.
5. Taste: Arrange a variety of "tasty" natural objects (miner's lettuce, licorice fern, sour grass, pine needles, ginger, etc.) on a table/level surface.

   Blindfold participants.

   Pass out pieces of each item, one at a time, recording responses as the item is tasted.

   Encourage analogies and very descriptive phrases.

   Tape each item next to its descriptions.

SAFETY:
- Defined boundaries set.
- When tasting, allow no swallowing.
- When choosing natural objects for each sense activity, do not disturb the environment.
- Organization: make sure groups stay together -- leaders' responsibility.

OBJECTIVE: - Children to hear, differentiate and list 5-10 sounds in the out-of-doors.

CONCEPT: - We should use our sense of hearing for more than just listening to people. There are many different sounds in the woods or meadow. We need to train our ears to hear, not just listen.

TIME: - 20 minutes

SEASON: - Anytime

LOCATION: - Any place away from the city

NUMBER: - Any

MATERIALS: - A pencil and paper for each child.

PROCEDURE:

Have the children spread out in an area and sit down. Tell them not to talk for five minutes and to listen to all of the sounds around them. Have them quietly write down each sound they hear. When five minutes are up, discuss the sounds heard and make a list to see how many different sounds were heard in total.

VARIATIONS:

Record different sounds in the out-of-doors. Have a listening game later inside to see what the sounds are.

SOURCE: - Class resource material: Sensory Awareness programs.

TREE TALLY

We often visit a forest and can't see the *trees* for the *forest*. However, if we look carefully, we can often find a wide variety of trees obscured by the rich blend of foliage.

The *line transect* is one sampling technique for sorting out the varieties and numbers of plants in an area. The procedure consists of counting the plants and the kinds of plants along a straight line.

In Part One of *Tree Tally*, the youngsters use a variation of the line-transect technique to investigate a forest site. They first set out lines in a zigzag pattern, and then take leaf samples from the trees along the lines. With their samples they make a simple graph or *histogram*, which organizes the leaves so that the youngsters can determine the number and varieties of trees in their site. In Part Two, the youngsters run a Forest Leap Frog race based on this information.

Trial Edition
Set IV

This material is based upon research supported by the National Science Foundation under Grant No. SED72-05823. Any opinions, findings, and conclusions or recommendations expressed in this publication are those of the author and do not necessarily reflect the views of the National Science Foundation.

Outdoor Biology Instructional
Lawrence Hall of Science
University of California
Berkeley, California

MATERIALS

For each team of two:

For Part One:

1 30-m length of string wound on cardboard*

1 paper or plastic bag

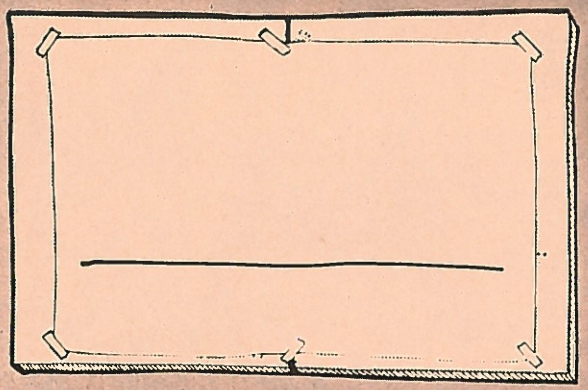
For Part Two:

1 4-m length of string wound on cardboard*

*See the "Preparation" Section.

For the group:

2 data boards (taped together) with a line drawn 10 cm from the bottom



1 marking pen

1 roll of clear adhesive tape

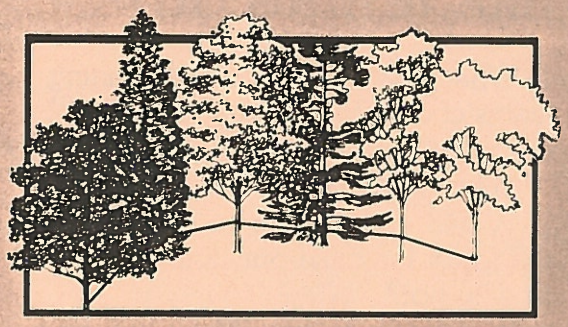
PREPARATION

Selecting a site. Choose a densely forested area with at least four different kinds of trees. The trees should be no more than 1.5 to 2 meters apart. If the trees in your area are farther apart, you can increase the length of the strings mentioned in the "Materials" section to 40 meters and 5 meters. (See Part One, step 2 and Part Two, step 2b in the "Action" section.)

ACTION

PART ONE CHALLENGE: FIND THE MOST COMMON TREE IN YOUR FOREST AREA.

1. Ask the group to guess how many kinds of trees are in the area. Then tell the youngsters that they will use an OBIS transect to find out how many kinds of trees are in the area.
2. Demonstrate the following OBIS-transect procedure with one of the youngsters.
   a. Tie one end of the 30-m string (or 40-m string) to a tree. The tree should be taller than the youngster.
   b. Begin unwinding the string and move to the next tree, which must be only one step or leap away from the first tree. (If you had to increase the length of the string, the trees can be two paces apart.) Find a likely tree, jump to it, and pull the string taut. The string must touch the new tree. Wrap the string around the tree if necessary. Then move to the next tree that is a leap away.
   c. Try to move in one general direction as you zigzag from tree to tree.



3. Divide the group into teams of two. Give each team one 30-m length of string and a paper or plastic bag. Assign each team a different starting tree. Each starting tree should be at least five meters from any other starting tree. Point the teams in the same direction to avoid tangled lines and let them set up their OBIS transects.

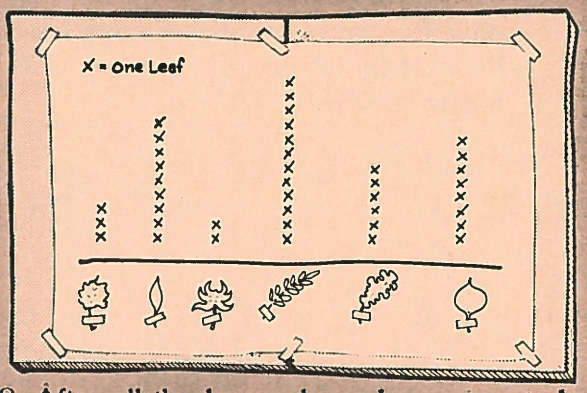
4. After all the teams have placed their lines, ask the youngsters to predict which kind of tree is the most common in the forest. Let the youngsters describe the kinds of trees any way they can.

5. Tell the youngsters that they will now count the trees included in their transects. Each team should go back along its line and pick *one* leaf from each tree touching the line. If they can't reach a leaf on a tree, the youngsters may have to shake the tree to loosen a leaf. They may also look carefully at the leaves on the tree and then find the same kind of leaf on the ground or on a smaller tree.

6. After the youngsters have finished collecting their leaves, call them together around the data boards. Tell the youngsters they can use the leaves they have collected to find out which kind of tree is the most common. Ask them how they can tell if one leaf is the same kind as another. Let the youngsters decide on their own criteria, but you might suggest looking at the leaves' shapes, edges (smooth or jagged), and surface textures (hairy, smooth, or sticky).

7. Instruct each team to put each type of leaf into a separate pile.

8. Ask each team to hold up one leaf that they think is from the most common tree. Tape that leaf under the line on the data boards and have all the teams report how many leaves like it they collected. In a vertical column above the leaf, make an X for each matching leaf collected. Make the X's the same size. Have the teams repeat the recording procedure for each kind of leaf they found.



9. After all the leaves have been counted and recorded on the data boards, tell the youngsters they have made a *histogram* of the trees in the area. Ask the youngsters to look at the histogram and tell you how many kinds of trees they found in the forest. Which tree is the most common? How do their original predictions compare with the results?

10. Have the teams rewind their 30-m strings onto the cardboard.

PART TWO CHALLENGE: SELECT ONE TYPE OF TREE AND RUN A FOREST LEAP FROG RACE BETWEEN TREES OF THAT TYPE.

1. Designate a starting point and a finish line about 50 meters apart. Use a 30-m string for the finish line.

2. Demonstrate the game with one of the youngsters.

a. Each team of two selects one kind of tree, e.g., red oak. Two or more

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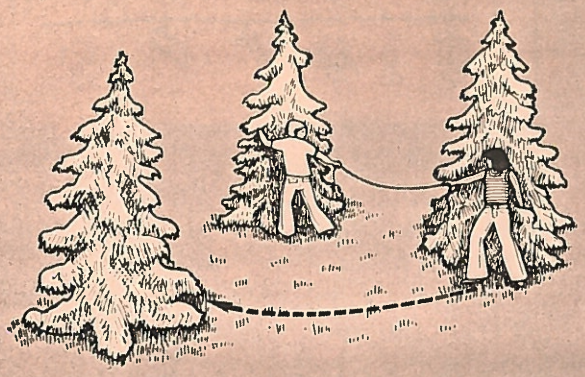
University of California
Berkeley, California
94720

Outdoor Biology Instructional Strategies

teams may choose the same kind.

b. Each member of the team holds onto the opposite ends of the 4-m (or 5-m) string *throughout the race*.
c. Both members of the team start at the same red oak. They should both be touching the tree.
d. At the signal "Go!", partner A moves to another red oak, while partner B remains touching the starting tree. As soon as partner A touches the second tree, partner B lets go of the starting tree and looks for a third red oak. Remember that the string limits how far the partners can "leap-frog" to the next tree.



e. The "leap frog" continues until all the teams reach the finish line.

3. Give each team a 4-m string and let them choose a starting tree. Make sure the starting trees are about the same distance from the finish line.

4. Run the race a number of times. Encourage the teams to use a different kind of tree for each race.

BRANCHING OUT

1. What kind of tree did the winning teams choose? According to the histogram, how common are the trees chosen by the winners?

2. Would a histogram for other parts of the forest look like our histogram? Why or why not?

3. If we came back in fifty years, how might our OBIS transect and histogram be different?

FOLLOW THROUGH

Go to another part of the forest. Give the teams a few minutes to look carefully at the trees and to choose one kind for another game of Forest Leap Frog. Run a few races and compare the results with the races run at the first site.

WHAT TO DO NEXT

Leaf Living	Set IV
Fly a Leaf	Set III
Pigment Puzzles	Set III
Plant Patterns	Set II
Bean Bugs	Set I

Signs of Fall

16

SUBJECT
Science

GRADES
K-3

PLT PRINCIPLES
1. Environmental Awareness
6. Life-Support Systems
5. Management and Interdependence of Natural Resources

CONCEPTS
1.1 Variety and Aesthetics Essential to Life Support
6.2 Constancy of Biological Change
6.22 Changes in Living Things
5.21 Plants as Renewable Resources

SKILL
1. Gaining Information

OBJECTIVE

Students will be able to describe some of the differences between deciduous and evergreen trees.

ACTIVITY

In autumn, take your students on a walk through a wooded area where there are deciduous and evergreen trees. Ask them to observe as many things as possible that indicate fall is approaching and describe the observations in terms of colors, shapes, and sizes.

Hold a discussion in a convenient place outdoors, or in the classroom if no other place is available. The students could observe and discuss such questions as:

How many different colors can you find?

Which tree has the brightest yellow leaves? The deepest red leaves? The darkest green leaves?

What causes the leaves to turn colors? And in some trees, but not in others? (Be sure to be prepared for this one! See *Why Leaves Change Color*, U.S. Forest Service publication [listed in bibliography].)

What color are most of the leaves on the ground? Describe what you see happening to the leaves on the ground.

Can you find bits of leaves in the soil? What might be causing them to fall apart? What might they do for the soil?

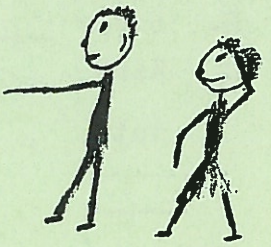
The leaves of many evergreen trees look like needles. What is happening — or not — to the evergreen leaves (needles)?

Can you find the leaves (needles) of evergreen trees on the ground? Are there any dead leaves (needles) on evergreen trees? What different reasons might there be for evergreen trees to lose their leaves (needles)?

Do all trees lose their leaves at the same time? Some trees do shed their leaves all year round. How can we tell?

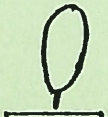
WHAT IS THAT TREE?

Student's name _____



" _____ "

1. GENERAL SHAPE


other ☐

2. BRANCHING

A. Structure (Stand back away from the tree and observe the position of the branches in respect to the trunk.)

downward ☐

straight-out ☐

upwards ☐

B. Spacing (Stand at the base of the tree and look upward. Are the branches:

close together ☐ far apart ☐

C. Arrangement

alternate ☐

opposite ☐

3. BARK

A. Color _____

B. Texture or feel

ridges ☐ smooth ☐ shaggy ☐ projections ☐

4. FLOWERS

A. Color of petals _____

B. Size _____

C. Number of petals _____

student's name _____

5. FRUIT

A. Shape _____

B. Size _____

C. Kind

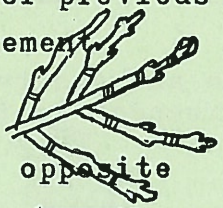
nut	berry	pods	winged	other, describe
☐	☐	☐	☐	☐

6. TWIGS

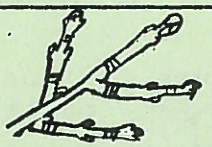
A. Color of last year's growth _____

B. Color of previous year's growth _____

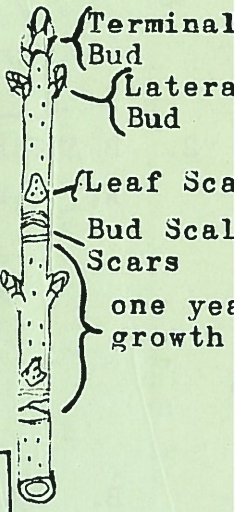
C. Arrangement



opposite ☐



alternate ☐

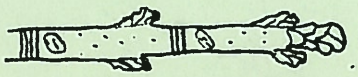


D. Thickness _____

E. Draw a sketch

7. BUDS

A. Arrangement



opposite ☐

alternate ☐

B. Color _____

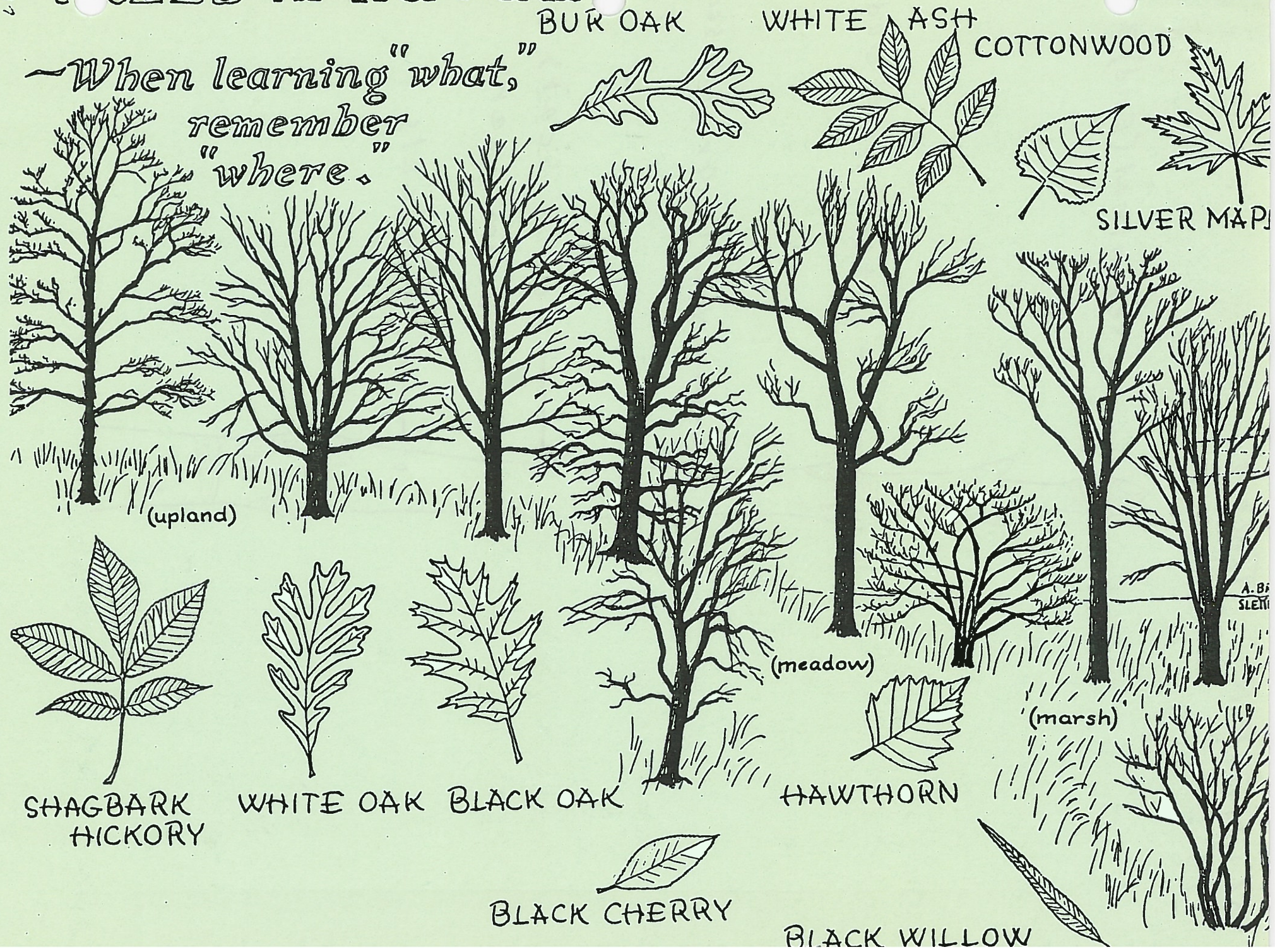
C. Length _____

D. Draw a sketch

8. OTHER FEATURES OF THE TREE

TREES in AUTUMN

~When learning "what,"
remember
"where."



WINTER Twig

Terminal (End) B

Lateral (side) Bud

yearly Growth sca

Leaf scars

vein scars

Lenticels

Read the Signs!

YOUR TREE

What kind is it?

Follow the Arrows!

CONIFEROUS

- Leaves Needle Shaped
  - Leaves Single
    - Flat Needles
      - Hemlock
      - Balsam
    - Angled Needles
      - Spruces
  - Leaves in Groups
    - Pines
  - Leaves in Clusters
    - Tamarack (Deciduous)
- Leaves Not Needle Shaped
  - Red Cedar
  - White Cedar

DECIDUOUS

- Alternate Branching
  - Simple Leaves
    - Leaves Lobed
      - Oaks
      - some Hawthorns
    - Leaves Not Lobed
      - Thorns
        - some Hawthorns
      - Papery Bark
        - The Birches
      - Flattened Stems
        - The Poplars
      - Twigs with Wintergreen Flavor
        - Yellow Birch
        - River Birch
      - Others
        - Elms
        - Willows
        - Cherries
        - Ironwood
        - Beech
        - Blue Beech
  - Compound Leaves
    - The Hickories
    - Walnut
    - Butternut
- Opposite Branching
  - Simple Leaves
    - Leaf Outline Smooth
      - Hard Maple
    - Leaf Outline Toothed
      - Soft Maples
  - Compound Leaves
    - The Ashes
    - Box Elder

Note:
This "tree road map" will help direct you along the right route to identify your tree. To complete your journey and make sure you have the right species, read carefully what it says about each species in the guide.

TUCK'S THING

TASK A (15 minutes) work individually or in pairs

Explore this area, pick out something in the environment (does not have to be an object), observe it carefully, then write five descriptive words about it or a short phrase which describes it.

TASK B (10 minutes) work individually

Sit and listen carefully to sounds in your environment. List sounds you hear and then write, in your own words, the best short description that will tell others what each sound is like to you and the impression it makes on you. Try to create the mood the sound gives so others will sense and feel the way you want them to.

TASK C (5 minutes) work individually

Make a list of 5-10 of your favorite things. Then make another list of things you don't like at all.

_____

_____

_____

_____

_____

_____

_____

Now answer these questions:

What is your favorite color? _____

How does it feel? _____

How does it taste? _____

How does it smell? _____

How does it sound? _____

TASK D (10 minutes) individually or in pairs - optional

How do colors make you feel? _____

How does black make you feel? _____

How does red make you feel? _____

How does green make you feel? _____

How does white make you feel? _____

How does blue make you feel? _____

TUCK'S THING

Blindfold Walk (20 minutes)

"Let's all try this: get into groups of two, blindfold one person and go for a walk, one person being the leader and one blindfolded, then switch places. Try to see if your feelings affect your sense of touch. What can you find out about this environment without your sense of sight?"

OPTIONAL

TASK E (5-10 minutes) individually

Write your own feelings about one of the following:

"What color is the wind?"

"What is the sound of a blade of grass?"

"When does the mountain feel small and yellow?"

"If the sunshine is a girl, what is her name?"

OR - Pick out something in the air, earth, or water that excites you. Imagine that you've turned into that thing. Write a poem about what it's like. Don't use rhyme.

53

The Value of 100 Acres of Forest Land

SUBJECTS
Social Studies
Science
Vocational Agriculture

GRADES
10-12

PLT PRINCIPLES
5. Management and Interdependence of Natural Resources
6. Life-Support Systems
4. Societal Perspectives on Issues
7. Lifestyles
2. Diversity of Forest Roles

CONCEPTS
5.1 Interdependence of Resources
5.2 Depletion Dangers
5.4 Values vs Uses
5.5 Trade-offs
6.1 Dynamic Biological Systems
6.3 Interdependence of Living Things and Their Environment
6.4 Biological Needs
4.4 Variety in Use
7.12 Determination of Resources and Their Values
2.124 Aesthetic Benefits

SKILLS
V. Problem Solving
I. Gaining Information

OBJECTIVE

Students will be able to describe some of the complex factors that go into determining land values.

ACTIVITY

In this activity, students will attempt to attach values of different kinds (economic, aesthetic, genetic, etc.) to a particular area of forest land.

Divide your class into groups. Ask each group to do research* to determine a land value in one of these categories:

Lumber Value — Choose an area of forest land and count the number of trees. Find out from a local resource agency or forest industry representative how to make a rough estimate of the number of board feet yielded per tree and the number that could be obtained from 100 acres (or 100 hectares). Check with a lumberyard to determine the retail price of lumber per 1,000 board feet. Contact a timber company and ask the cost of converting trees to 1,000 board feet of lumber and transporting the product to the lumberyard. Subtract this amount from the retail price quoted by the lumberyard. What might this 100 acres (or 100 hectares) of forest be worth in dollars for lumber?

Note: This figure does not take into account marketable byproducts; for example, particle board or pressed wood logs.

What might be the value of this forest land and its lumber other than as measured in dollars; for example, as a source of inspiration and solitude.

Watershed Value — Discuss the concept of a watershed and the ways in which a forest affects the amount of water available in an area.

Using the same 100 acres (or 100 hectares) as the sample, check the amount of rainfall in that area and calculate the rainfall on 100 acres (or 100 hectares). Amount of rain in feet x 43,560 square feet/acre = cubic feet of water/acre x 7.5 gallons/cubic feet of water = gallons of water falling on 1 acre. Amount of rain (in meters) x 10,000 square meters = cubic meters of water/hectare ÷ 100 = water falling on 1 hectare. From the local water company, find out the money value of 1,000 gallons of water (or cubic meters). What is the money value of the amount of water that fell on the sample plot?

From the U.S. Weather Service or your local Soil Conservation Service find out what percent of the rainfall they estimate does go into sources (aquifers, streams, etc.) available for human consumption. How would this compare with the same amount of rainfall, falling on a plot of the same size in open prairie, for example?

(Continued)

53

Calculate approximately what the forest is worth economically to people as a watershed. Attempt to calculate what the forest is worth as a watershed to living things other than people.

Wildlife Value — Find out what types of wildlife inhabit this forest land. How many animals and birds? Are there any, such as deer, turkey, or quail, which are hunted by humans? Determine how much money hunters spend locally on licenses, guns, ammunition, equipment, lodging, travel, and guides. Include any forms of nonconsuming uses related to wildlife (photography and bird watching, for instance) that generate economic income in this area. What is the total wildlife value (as measured in dollars) of this land?

Describe the wildlife value of this land other than in dollars; for example, as a gene pool for future generations.

Recreational Value — Determine what forms of recreation take place in the forest. Find out what camping or parking charges are levied per day. How many people use this forest for camping or other recreation, and how much money do they spend in the area? What is the total recreational value measured in dollars? What recreational values in the forest are not easily measured in dollars?

Forage Value — Determine whether cattle or sheep could use this land for grazing. How many animals could it support? How much are the animals worth on today's market? What are the total forage values, economic and other values?

Note: The forest's intangible values of wildlife, meteorological influences, and aesthetics may be harder to calculate but are nonetheless real and worthy of consideration. Each of the sections above asks the students to invent other ways to determine value than dollar income.

After all the information has been collected, researched, and shared by the class, lead a discussion. Students may not be able to resolve the issues involved, but they may become aware of the complexities of land-use management. Consider specific questions such as:

If the community wanted to clear this 100 acres (or 100 hectares) of forest in order to build homes, provide farm sites, or put in a highway, how would the proposal influence the land's value? Decide which uses make the land more valuable. To whom? Specify how you are measuring value. Find another way to measure value. Does your answer change?

Decide whether the various values determined for this 100 acres (or 100 hectares) could be applied to other areas of the same size but of different forest types. Specify what variables might make a difference in the economic, or the "intangible," values of the area, and from whose viewpoint.

53 (Continued)

Decide which uses make the land more valuable in the long run, specifying from whose point of view and by what means the value is measured.

What trade-offs are involved when we convert forest land from multiple use or a few dominant uses? Society needs houses, farms, and roads, but we also need forests. Decide whether and how we can have them all.

Find out who determines the uses of forest land.

*Students may find any of the following to be useful in their research:
Newspaper advertisements
Water company/municipal waterworks
Local lumber businesses and foresters
U. S. Soil Conservation Service
U. S. Weather Service
State Department of Wildlife or a similar agency
U. S. Forest Service
State Department of Recreation/Parks or a similar agency
Citizen conservation groups

Water We Doing?

46

OBJECTIVE

Students will be able to describe the importance of water to living things.

ACTIVITY

Suggest that the students keep track of the ways in which they use water directly during one day — flushing the toilet, drinking, cooking, washing, and so on. The following figures, though approximate, may help in estimating water use.

- Flushing the toilet uses 5 to 7 gallons per flush.
- A shower can use from 5 to 15 gallons per minutes. (An average shower might use 6 to 7 gallons — but it depends on how long you stay in!)
- Filling the bathtub could use from 25 to 30 gallons (but it depends on how full!).
- A clothes washer uses 25 to 30 gallons per load (larger machines use up to 50 gallons).
- A dishwasher uses 15 gallons per load.
- The bathroom faucet left running can use 2 to 5 gallons per minute.

If the students do not have a water meter to read in order to determine the amount of water they use in a given period of time, suggest that they figure out some other way to estimate the total number of gallons they use in a given day.

Ask the students to invent ways to cut their water use in half . . . and then do it! They might try it for three days. Talk about whether trees and other living things can conserve in their water use. Talk about adaptations plants and animals make in their use of water. Discuss the importance of water to all living things.

EXTENSIONS

1. Pick a living thing to "become." Each of your friends can pick other different living things to become. Each of you can find out how much water and for what purposes you use water in a day. For example, you could find out approximately how much water a reindeer uses, a redwood tree, a saguaro cactus, or a dandelion. Find out whether the amount of water and the uses depend on the season of the year. For example, based on availability, your animals and plants may reduce their water demands and needs during some seasons. Compare the varying amounts and uses of water by the different living things. Graph the results.
2. Make a mural of the water cycle. Try it *with* human involvement; *without* human involvement; *with* animal involvement; *without* animal involvement; *with* plant involvement; *without* plant involvement; and *with* human, other animal, and plant involvement.
3. List five examples of "water rights." List five "water wrongs."

SUBJECTS
Science
Mathematics
Social Studies

GRADES
7-12

PLT PRINCIPLES
5. Management and Interdependence of Natural Resources
6. Life-Support Systems
7. Lifestyles

CONCEPTS
5.1 Interdependence of Resources
5.12 Renewable Resources
5.121 Efficiency of Resource Use
5.2 Depletion Dangers
5.24 Water as a Reusable Resource
6.1 Dynamic Biological Systems
6.111 Finite Matter
6.3 Interdependence of Living Things and Their Environment
6.31 Human-Biosphere Relations
6.4 Biological Needs
6.42 Carrying Capacity
6.421 Limiting Factors in Environments
7.1 Culture as Learned Behavior
7.12 Determination of Resources and Their Values
7.123 Behavior Effects on Environment
7.3 Resource Depletion Prevention
7.31 Consumer Effects on Forest
7.32 Conservation Through Product Design

SKILLS
I. Gaining Information
V. Problem Solving

Water You Know?

58

OBJECTIVE

Students will be able to describe the importance of water to living things.

ACTIVITY

Invite students, individually or in small teams, to act out scenes that demonstrate interactions between water and plants and animals (including humans).

Suggestions:

- Making a thirsty animal happy
- What happens when you water a plant
- A rainy day at school
- The day it snowed
- The year it didn't rain

After each scene has been enacted, ask the students in the audience to describe how the scene showed the importance of water to living things. After all scenes have been enacted, invite all the students to share in a discussion of the importance of water.

VARIATION

Pick one tree that grows or could grow in your area. Create a visual collage of its dependence on water and its interrelationships with other living and nonliving things. Once the collage has been completed, ask the students to discuss the importance of water to the tree. Then ask them to discuss the importance of water to all living things.

EXTENSION

Make individual lists of the ways humans use water. Combine these to make one large class list. Create a mural showing where the water for all these uses comes from and where it goes after it is used.

Discuss any apparent problems related to humans' use of water. Discuss any possible ways humans might make more effective use of water, considering such factors as continued water supply, water purity, vegetation, wildlife, industries, aesthetics, and lifestyles.

SUBJECTS
Science
Social Studies

GRADES
K-6

PLT PRINCIPLES
6. Life-Support Systems
7. Lifestyles

CONCEPTS
6.111 Finite Matter
6.3 Interdependence of Living Things and Their Environment
6.31 Human-Biosphere Relations
6.4 Biological Needs
6.41 Dependency on Environment
6.42 Carrying Capacity
6.421 Limiting Factors in Environments
7.12 Determination of Resources and Their Values

SKILLS
I. Gaining Information
V. Problem Solving

THE WEB OF LIFE

OBJECTIVE: - The participants will be familiar with the ecological principle that: everything is connected to everything else (interrelationships) by becoming part of the web of life.

CONCEPT: - All living things interact with other things in their surroundings.

TIME: - Approximately 30 minutes

SEASON: - Any time of the year

LOCATION: - A flat open space

NUMBER: - 8-10 students

MATERIALS: - (1) kit string, 30 pieces approximately 5 feet long; (2) 10 name tags with 10 safety pins. The name tags list 10 different living things found in the natural environment. Example: frog, snake, grass, horse, lion, hawk, sun, etc.

PROCEDURE:

1. Distribute 3 sections of kite string and name tag with safety pin to each student.

2. Ask the participants to form a circle and pin their name tags in place; each student is now the living thing listed on their name tag.

3. Briefly discuss the concept that all living things interact with other things in their surroundings.

4. Ask one person to start the web of life by handing the end of one of their strings to another student who interacts with them in the environment. As each one hands out a string have them explain how the living thing they represent is related or interacts with the other. Continue around the circle until each participant has given out all of their strings.

5. After all strings are given out, briefly comment on the pattern of interrelationships.

6. Ask participants what would happen if one living thing was removed from the web. Select a key person and have him/her drop the string and discuss the potential results if he/she were removed from the environment.

SAFETY: - This is a safe activity, but leaders should caution participants on the use of safety pins when attaching their name tags.

FIELD TESTING COMMENTS:

The activity was tested without having the living things listed on the name tags. This approach was not considered as good as having the living things already listed on the name tag.

The activity was widely accepted.

WET SAND PILLARS

OBJECTIVE: - Students will learn how sand and water can make formations by creating a simple sand pillar or "sand castle" of their own.

CONCEPT: - Sand and water can create geologic structures.

TIME: - Thirty minutes to one hour

LOCATION: - This activity is ideal at the beach, but can be adapted for other areas.

SEASON: - Summer is best

NUMBER: - Six to eight

MATERIALS: - Lots of sand
Water

PROCEDURES:

By scooping up wet sand, participants can let it drip from their fists or fingers. Let each see how high a pillar he or she can build. See who can build the steepest walls, bridges, cliffs, etc.

Compare these structures to natural structures, e.g., Grand Canyon, Arches National Monument, etc.

SAFETY: - If done at the beach, the biggest hazard is sunburn. Keep an eye on children so that they don't spend too long at this activity.

WHAT DID YOUR LUNCH COST WILDLIFE?

Objectives

Students will be able to: 1) trace some foods back to their source, including the impact on wildlife and the environment along the way to the consumer; and 2) recommend, with explanations, some food habits that could benefit wildlife and the environment.

Method

Students trace food sources, diagram environmental impacts, and apply the knowledge they gain by making changes in some of their consumer choices.

Background

NOTE: Especially for younger students, this activity makes a nice summary companion to "What's For Dinner?"

Most of us make lifestyle choices each day that have some impact on wildlife and the environment. Many of those impacts are indirect, and therefore we are not as aware of them as we might be. The choice of foods we eat, for example, is an area with many implications for wildlife and the environment.

The places and ways in which foods are grown has impact. For example, we know that loss of habitat is one of the most critical problems facing wildlife. Habitat may be lost to agricultural use or development as well as to industrial, commercial, and residential uses. Given that people need food, the ways in which we grow that food --and the ways we care for the land in the process—are very important. Farmers can take measures to maintain and improve wildlife habitat as they grow and harvest their crops. They can pay attention to the impact of their growing practices. Both inorganic and organic fertilizers are commonly used in industrial agriculture. These compounds may run off or leach into water supplies. In lakes, for example, this run-off may contribute to a huge increase in the growth of plant nutrients such as algae. This excess growth can act as a pollutant, poisonous to aquatic animal life such as fish, amphibians, arthropods, and insects.

Use of insecticides and herbicides also affects the environment, including wildlife. Obviously, if pesticides kill and eliminate the food source for wildlife, the wildlife either leaves or dies. Indirect effects can include accumulation of such pesticides in the bodies of animals—as in predatory birds, fish, and mammals, including people.

Age: Grades 4—12
Subjects: Social Studies, Language Arts, Science, Home Economics, Vocational Agriculture
Skills: analysis, application, classification, comparing similarities and differences, discussion, drawing, evaluation, media construction, problem-solving, synthesis, visualization, writing (limited)
Duration: one to three 45-minute periods
Group Size: any
Setting: indoors
Curriculum Framework Reference: VII.A., VII.A.1, VII.A.2., VII.A.3., VII.A.4., VII.B., VII.B.1., VII.B.3., VII.B.7.
Key Vocabulary: organic, inorganic, source, renewable, nonrenewable, impact

Not all of the impact is due to some farmers' practices, however. Certainly, the transportation, processing, packaging, and marketing industries are involved as well. Questions about the natural resources involved in getting the food from its source of origin to the consumer are critically important. One example is increased exploration for and development of fossil fuels used to transport the food from growing site to consumer, used often to fuel the processing, and frequently used in the packaging, as in the case of fossil fuel-derived plastics.

If the students have concern about adopting lifestyle habits that can be healthful to themselves at the same time they have less impact on wildlife and the environment, they can look at the food they eat as one place to begin. The major purpose of this activity is to provide a means for students to begin that process.

Materials

writing and drawing materials

Procedure

1. Ask the students to generate a list of foods they either brought or bought for lunch. Be sure to include any packaging materials the foods came in.
2. Ask each student to pick one food to trace all the way back to its origins—including where and how it grew, was harvested, was transported, was packaged, and was made available to the consumer. . . the student. Ask the students to make simple flow diagrams of the path the food takes. (The students may want to do some research at this point to get some additional information.)
3. Next ask the students to add drawings of possible and likely impacts to wildlife and the environment along the path their food took to get to them.
4. Ask the students to report back to their classmates—using their diagrams as a visual aid as they describe the path taken by their food, and its impact to wildlife and the environment along the way.
5. Ask the students to discuss and summarize their findings.
6. Ask each student to think of one change he or she could make in his or her own lunch-time eating habits that would be likely to have a beneficial—or at least less harmful—effect on wildlife and the environment. Describe the reasoning for this change, and evaluate its consequences. If, after examination, each chang seems in fact to be helpful, suggest that th students try making their changes for a week At the end of the week, ask the stude report back. Were they able to stick with th change? What happened? If they didn't make th change, why not? Did they forget? If they did make the change, did they find themselves mak ing or thinking about any other possible changes? If yes, what were they?

Extensions

1. Map the **energy** used to grow and get the food to you.
2. Include impact on other specified natural resources along the way.
3. Distinguish between renewable and nonrenewable resources.

Evaluation

Trace the possible course of a container of milk served in your school back to its probable source.

What impact does this journey have on wildlife?

Name three food habits that could redu negative impacts to wildlife and the enviro ment. Explain the reasoning behind your suggestions.

WHAT LIVES HERE? in the Water

What lives in the water?

Plants?

Animals?

For man, water is an alien environment. Only by taking his own atmosphere with him can man spend any time beneath the water. Perhaps the alien nature of water accounts for the special fascination most people have for aquatic life. Whatever the reason, people seem to enjoy exploring an aquatic site and discovering what lives there.

This activity can be used as an exploratory introduction to the life in any aquatic system: pond, lake, reservoir, stream, or other body of water. After an investigation of life found in water, the term organism is introduced to the group. An **organism** is any living thing, plant or animal.

DISCOVER AND INVESTIGATE SOME OF THE PLANTS AND ANIMALS THAT LIVE IN YOUR AQUATIC STUDY SITE.

PREPARATION

Select a site that provides easy water access and an unobstructed view for easy supervision. Avoid sites with steep or slippery banks. Read the safety section in the *Leader's Survival Kit* folio.

MATERIALS

For the group:

data board (optional)

For each team of two:

Observation Aids*
Pond Guide
2 dip nets
2 Bug Boxes or magnifying lenses
1 white-bottomed container
2 team-site boundary markers
1 clear plastic cup
1 spoon

*See the "Basic Aquatic Equipmen card in the *OBIS Toolbox* folio for t use of these aids.

Note: Certain hard-to-get items su as Bug Boxes, magnifiers, and thermometers are available from th Lawrence Hall of Science. See the order form in the *OBIS Toolbox* fol

BRING 'EM BACK ALIV

The success of this activity, and oth that deal with living organisms, spri from the natural curiosity and inter people have for organisms living around them. Before your group begins this activity, ask for suggesti as to how life can be effectively investigated without causing it any harm. Use their suggestions to emphasize that care should be tak whenever a plant or animal is bein studied. Organisms should be retain temporarily for observation purpos and then returned unharmed to th source, so that others may find the same pleasure in the activity site.

ACTION

1. At the aquatic study site, challenge the group to find out what lives in the water.
2. Establish a conservation-oriented investigative procedure (see Bring 'em Back Alive!).
3. Divide your group into buddy teams of two. Tell the teams that buddies *must* stay together so that one can report any problem his buddy might encounter while working around the water.
4. Define the overall study-site limits and distribute the team markers. Let the teams mark off their boundaries and then return to the assembly point for their observation aids.
5. Show the teams the materials available for use.
   a. Demonstrate the use of the dip nets and Bug Boxes or magnifying lenses.
   b. Explain to the youngsters that the *Pond Guide* is available if they want to find out the name of any plant or animal they discover in the site.
6. Encourage the teams to return to their study sites and use the observation aids to observe and identify as many different kinds of plants and animals as they can. Save ten minutes at the end of the activity for sharing discoveries. One way to do this is to place all of the white-bottomed containers in a circle so all participants can see what was found.

WHAT DO YOU THINK?

- ☐ How many different plants and animals were found?
- ☐ Which plant and which animal was most abundant?
- ☐ Which plant and which animal was least abundant?
- ☐ Who found a plant or animal that nobody else found?
- ☐ Is this lake (stream, pond, etc.) richly or poorly populated with life?

FOLLOW THROUGH

End the discussion by explaining that plants and animals are called organisms by scientists. Write **organism** and its definition so that everyone can see it. Ask the group how many different kinds of organisms they can name.

WHAT TO DO NEXT

Habitats of the Pond
Animals in a Grassland
Sticklers
Habitat Sun Prints

Outdoor Biology Instructional Strategies
Lawrence Hall of Science
University of California
Berkeley California

Supported by a Grant from the National Science Foundati

SUB-SURFACE FRESH WATER ORGANISMS

1. Planaria *(Turbellaria)*
   Planarians are fairly common in ponds, lakes, springs, and other fresh waters among vegetation, beneath stones, or crawling over the bottom. These free-living flatworms are usually arrow-shaped and vary in color from white to black depending on species and environment. Small planaria look much the same as the adult, differing only in size.

2. Bryozoan Colony *(Bryozoa)*.
   Fresh-water Bryozoa are very common in lakes, ponds, and rivers. They are community dwellers, living in jelly type substance which is formed on sticks as a gelatinous ball or a mossy mat over the surface of underwater objects. There is a wide range in color; some colonies are brownish and still others have a greenish tinge. Colonies are made up of thousands of these tiny animals.

3. Leech *(Hirudinea)*
   Leeches make homes in lakes, ponds, or other fresh-water areas. They can be seen moving about underwater by their well-known "Measuring Worm" type of travel, or swimming freely. Leeches are predatory or parasitic segmented worms with sucking discs which are used in attachment, movement, and feeding. They are usually dark brown to black in coloration.

4. Daphnia *(Cladocera)*
   Daphnia are found in all sorts of fresh waters. The shallow, weedy backwaters of a lake whose water level is fairly permanent harbors greater numbers that any other kind of locality. These little crustaceans are virtually transparent and are best recognized by their two-branched antennae, robust bodies, and sharp-tail spine.

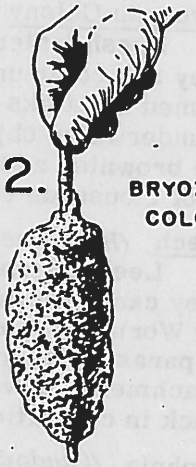
5. Cyclops *(Copepoda)*
   These little fresh-water crustaceans are very familiar in all slow moving waters, especially shallow ponds. Their bodies, like the Daphnia, are very transparent and are characterized by the forked antenna and the branched tail. The female usually has two groups of eggs attached to her body just ahead of the tail.

6. Fairy Shrimps *(Anostraca)*
   For the most part, fairy shrimps live in temporary pools and ponds of fresh water. They are frequently seen underwater, rowing themselves about on their backs, by means of numerous, similar, flattened appendages. These appendages are always faced toward the source of light.

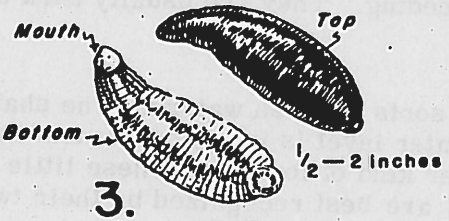
7. Fresh-Water Shrimp *(Malacostraca)*
   These are found in lakes, streams, and ponds in eastern and western Oregon. Shrimp are usually found among the aquatic plants, rocks, and algae. Usually they are nearly transparent and look something like a "sow bug".

SUB-SURFACE FRESH WATER ORGANISMS

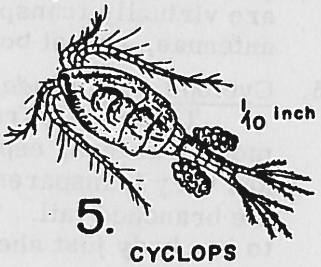
1. PLANARIA



2. BRYOZOAN COLONY



3. LEECH



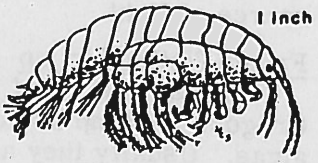
5. CYCLOPS

DAPHNIA

4.

FAIRY SHRIMP 1 inch

6.



7. FRESH WATER SHRIMP

AQUATIC INSECTS

1. May Flies *(Ephemerotera)*

May flies are abundant in streams and lakes and can be found in practically all fresh water throughout the state. The nymphs are found on the undersides of rocks or other underwater objects. They have two or three tails. The wings of the adult are held in an upright position while resting.

2. Dragonfly *(Odonata)*

They are found in all types of fresh-water areas: ponds, lakes, streams, and swampy areas. The nymphs can be found crawling about on the bottom, on aquatic plants, or other underwater objects. They are one of the largest aquatic insects; most of them are dark brown to greenish as juveniles and change to brighter colors as adults. When resting, their four wings are held outstretched.

3. Stone Fly *(Plecoptera)*

Stone flies seem to require running water in which to live. They are never found in lakes except in the inlets and outlets. When the adult is resting its wings lie lengthwise upon the back. Nymphs are found in abundance only among the rocks in streams. Stone fly nymphs have two long and stiff tails.

4. Water Boatman *(Hemiptera)*

Boatmen are found in nearly all waters. They swim in an erratic pattern underwater and are usually found in slow moving waters. Boatmen are normally brownish in color and equipped with leathery wings.

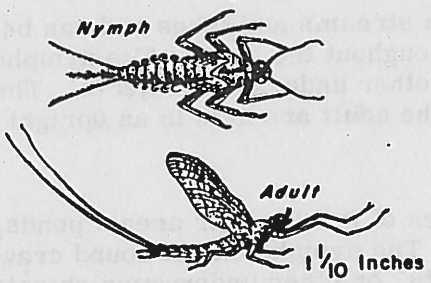
5. Water Strider *(Hemiptera)*

Water striders are a familiar sight on the surface of slow moving waters, ponds, and lakes. They resemble long legged spiders. Although equipped with wings, they are rarely observed in flight. Their color is usually brown to gray. Many persons call them "water skippers".

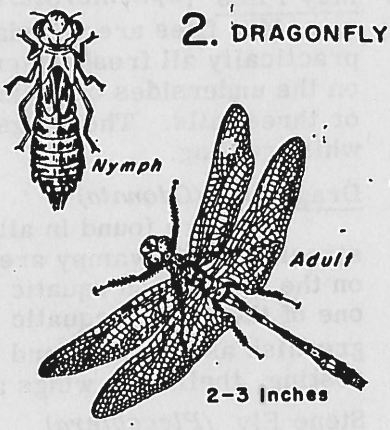
6. Caddis Fly *(Trichoptera)*

Caddis flies are found in nearly all lakes, streams, and ponds. During their underwater life, they live in cases made from sticks and small particles of rock. These can usually be seen moving about on the bottom. When the adults are at rest the wings are held roof-like over the body and sloping down at the sides. The adults are generally dull brown or black in color. Sometimes the larvae are called "penny winkles" by fishermen. "Periwinkle" is another common name.

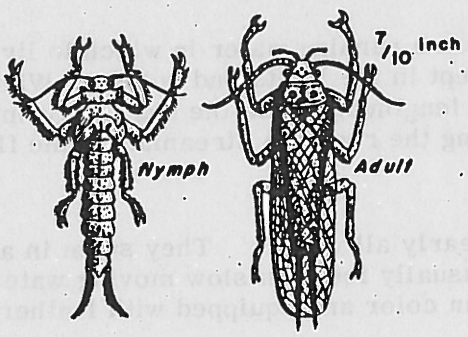
AQUATIC INSECTS



1. MAYFLY

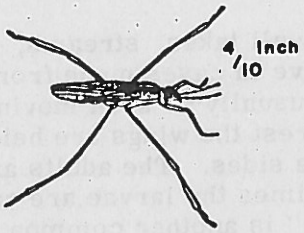


2. DRAGONFLY

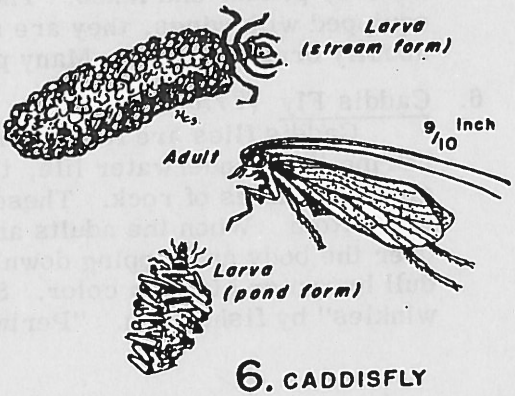


3. STONEFLY

4. WATER BOATMAN



5. WATER STRIDER



6. CADDISFLY

AQUATIC INSECTS

7. Whirligig Beetle *(Coleoptera)*

These are found on the surface of slow moving waters, taking advantage of the surface tension. The Whirligig Beetles, true to their name, whirl or swim on the water's surface. When disturbed they frequently dive under the water. Their bodies are dark colored, robust, and the front legs are long and slender.

8. Crane Fly *(Diptera)*

The larvae of the Crane fly are found in scum of shallow waters, in the damp soil along streams or lake shores, and marshy areas. The adults are never truly aquatic and may be found great distances from water. The adults look much like giant mosquitoes without a beak.

9. Mosquitoes *(Diptera)*

Mosquitoe larvae are usually found in stagnant, slow moving water. Most people are familiar with the appearance of adults and know that they are more abundant around marshy, damp areas. The young are often called "wigglers" and can usually be found wiggling about just under the water's surface. Contrary to popular belief, not all mosquitoes bite; the males just buzz and are not equipped for biting.

10. Black Fly *(Diptera)*

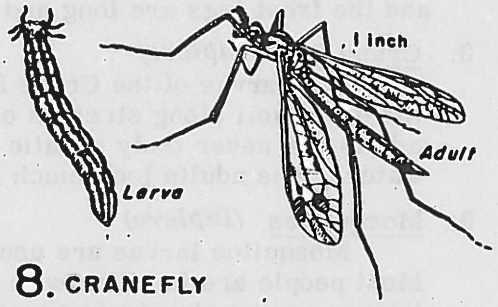
The larvae are found in flowing water (only) on stones, vegetation, or other objects, usually in the swiftest part of the stream. In many cases, the larvae are so numerous they appear moss-like over the surface of the attached object. Later on in life, they live in a cocoon which is customarily a boot-shaped structure. The Black Fly as the name implies, is usually a dark compactly built fly, with rounded, short, black, broad wings. The adults may be found great distances from water.

11. Midges *(Diptera)*

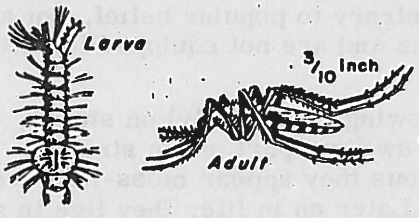
Larvae are most abundant in the shallow water areas of lakes, ponds, and streams favored by a heavy growth of aquatic plants. They prefer soft mucky bottoms, as they are a bottom-dwelling species, and need this type environment for constructing their tube-like homes. Larvae live in soft tubes; however, during later stages of life they are found living in silken cocoons or gelatinous cases. The adult Midges look much the same as mosquitoes. Their antennaes look like two feathers on the front of their head and they don't have a beak.

AQUATIC INSECTS

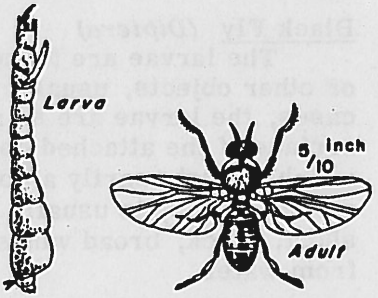
7. WHIRLIGIG BEETLE



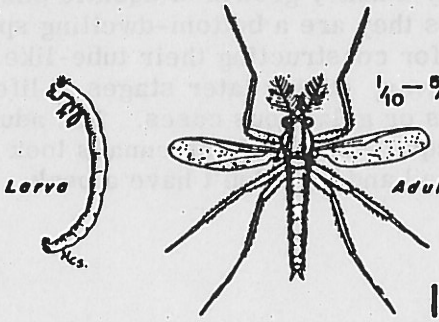
8. CRANEFLY



9. MOSQUITO



10. BLACK FLY



11. MIDGE

WHAT'S FOR DINNER?

Objective
Students will be able to generalize that all animals, including people, depend on plants as a food source, either directly or indirectly.

Method
Students list and analyze the sources of foods.

Background
Plants ultimately support all forms of animal life, including people, either directly or indirectly. Most people are omnivores, which means that they eat both plants and animals in some form. Some people include a lot of meat in their diets, others much less, and some people none at all. It is easy to see that people who are vegetarians—who eat only plants and plant products—are supported directly by plants. It may not be as easy for children to see that even when they are eating animal products, they are indirectly relying on plant sources. For example, cows from which milk and other products are derived, and chickens which provide eggs and meat, are animals which depend upon plants for some or all of their food. Every animal, including people, either eats plants directly—or depends for food upon other species which in turn depend upon plants.

The primary purpose of this activity is for students to trace human and other animals' dependence upon plants for food.

Materials
writing materials, chalkboard; poster board and drawing materials optional

Procedure
1. What's for dinner? Ask students to go home and make a list of everything that they have for dinner on a particular evening—perhaps with help from a parent, brother, or sister.
2. In the classroom, ask the students to work alone or in groups to analyze where their food comes from. Every food should be traced back to a plant. As each item on a menu is examined, have the students to create a flow diagram or chain which shows the major sources of each food—from the product they eat all the way back to the plant origin. For example: Me Milk Cow Grass. Some chains will be short; others will be long. Sometimes the students may not be sure what particular animals eat for food, so they will want to ask or do some library research to find out.
3. Have a general discussion with the students: "What are some of the things you have learned from this activity?" After the students have described things they have learned, encourage them to make two generalizations about plants and animals: 1) all animals, including people and wildlife, need food; and 2) all animals, including people and wildlife, depend upon plants for food. (Watch for the insight that ultimately plants need animals, too! The decay of animal life after death into nutrients in the soil provides sustenance to plants as well!)

Age: Grades 3—7 (and older)
Subjects: Language Arts, Science, Health
Skills: analysis, classification, discussion, drawing, listing, media construction, writing
Duration: 20 minutes or longer
Group Size: any
Setting: indoors
Curriculum Framework Reference: I.A., I.A.1.
Key Vocabulary: food chain, plants, animals

Extensions

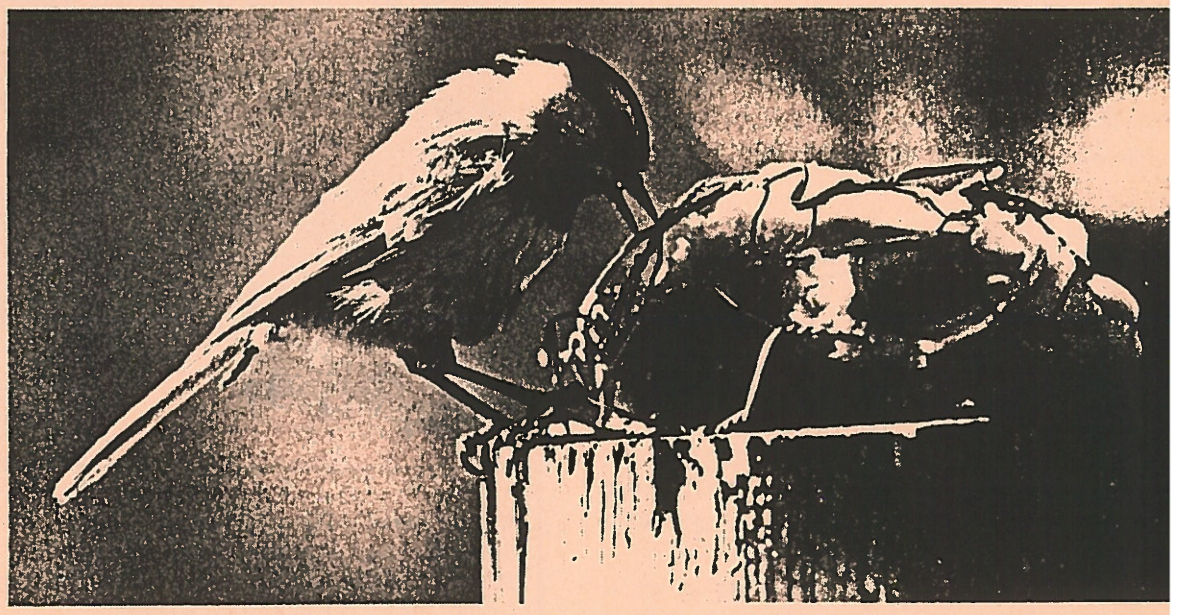
1. Create posters of the menus showing the food chains involved in each. Add soil, water, sun, and air—since these are necessary to plants, people, and all animals too!
2. Create a master list of all the plants that were identified. Look to see which plants we seem to depend upon more than others. Some students might be interested to know that other groups of people—like people in other parts of the world who live in different environments—could come up with a very different list of plants upon which they depend.
3. Adopt a rock! Did you know that everything you ate for breakfast (lunch, dinner, or a snack!) started somewhere with a rock! Trace plants to soil, and soil to its parent matter—including rocks!

Evaluation

Starting with people and using the or
listed below, construct at least three food
people, rabbits, grass, lettuce, wheat, cow
pigs, deer, acorns.

Which of these animals do not need food
snake, frog, people, robin.

All of the food eaten by animals must fir
from _____
(Although the objective of this activity s
that animals rely on plants, please acc
reasonable response—like soil, sunlight



WHICH NICHE ?

Objectives
Students will be able to: 1) define ecological niche; and 2) give at least one example of an animal and its ecological niche.

Method
Students compare ecological niches with careers in their community.

Background
Each animal has a role in the community. This is called its ecological niche. The niche includes such things as where the animal lives, where and how it gathers food, its role in the food chain, what it gives to and does for the community, its habits, periods of activity, etc.

An animal's niche can be described as "what it does for a living." In a sense, this can be compared to what people do for a living—that is, what their jobs or professions are in the community in which they live.

The major purpose of this activity is for students to understand the concept of ecological niche, simultaneously learning more about potential careers in their own community.

Materials
guest speaker, chalkboard, reference materials

Procedure
1. Explain to the students that in this activity they will be comparing human professions to the roles of animals in environments (animal "professions").
2. Begin with a discussion of jobs in your community. What jobs are there (those of parents, friends, their own, etc.)? (Optional: Invite a doctor, dentist, social worker, truck driver, cook, etc. to your class to talk about their work.) Select a few interesting jobs for discussion. (NOTE: If a speaker visits, ask these questions of them or provide them in advance. Work with the students to develop the questions. Have the students take notes and record the answers during

Age: Grades 7—12
Subjects: Social Studies (Community Studies, Economics), Career Education, Science (Biology, Life Science), Language Arts, Vocational Agriculture
Skills: analysis, application, classification, comparing similarities and differences, description, discussion, generalization, interview (guest speaker), listening, listing, public speaking, reading, reporting, research, small group work, synthesis, writing
Duration: one to four 45-minute periods
Group Size: any
Setting: indoors
Curriculum Framework Reference: III.A.2.
Key Vocabulary: ecological niche, career, community

or immediately after the presentation, asking additional questions for clarification as necessary.) Points to include:

- what they do for the community (the service provided)
- how they provide the service
- what resources are used by them in providing the service
- where they live and work
- the times during which they work
- what other professions they are dependent upon for the functioning of their profession (janitor, delivery person, secretary, repair person)
- what special adaptations (skills, tools, behaviors) they use or they are required to have
- what special habits they exhibit
- what other professions they compete with, if any
- what other professions they cooperate with, if any

Ask the students to produce a written summary of the information they acquire concerning each of the jobs they investigate.

3. Have the students brainstorm a variety of animals living in a particular community (forest, stream, desert, tundra). A photograph could serve as a stimulus. List representative members of this natural community on the blackboard. Make sure a variety of animals including predator, prey, scavengers, etc. are included.

4. Pick one of the animals listed and, as a group, begin discussing the same questions for it that were asked of the visiting professional. In this way the students can see how the "profession" concept applies as a metaphor. Identify the animal's profession as its "ecological niche." OPTIONAL: As individual projects or in teams, students should select one animal, research the "niche" it fills, and answer the same questions used for human jobs. As a culmination, each team can make a visual and/or verbal presentation about its animal and its niche.

Extensions

1. Identify niches which are overlapping and where there is competition or cooperation for resources and services. Connections may also be made between niches to illustrate interdependency webs in the community.
2. Investigate a variety of human professions in different communities or cultures for an emphasis on career awareness. Illustrate overlapping professions, competition, cooperation, and interdependency.
3. Develop commercials or ads for "recruiting" individuals into given ecological niches, using special contributions, advantages, etc. as points to highlight.
4. Students can select the animal they'd most like to be from among those studied, basing their selection on contribution of the ecological niche to the community's health, as well as other factors. Students can describe their reasons for their choices. They could do this for human professions, too!

Evaluation

Define ecological niche. Select any animal or person and describe its ecological niche. Include: what they do for the community, how they provide this service, the resources they use, where they live, when they do their work, what other organisms depend upon them, what other organisms they are dependent upon, what special adaptations they use or are required to have, what special habits they exhibit, what other organisms they compete with for the same niche, and anything else you think is especially interesting about this niche and how it is filled.

WHICH NICHE ?

Objectives
Students will be able to: 1) define ecological niche; and 2) give at least one example of an animal and its ecological niche.

Method
Students compare ecological niches with careers in their community.

Background
Each animal has a role in the community. This is called its ecological niche. The niche includes such things as where the animal lives, where and how it gathers food, its role in the food chain, what it gives to and does for the community, its habits, periods of activity, etc.

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The major purpose of this activity is for students to understand the concept of ecological niche, simultaneously learning more about potential careers in their own community.

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guest speaker, chalkboard, reference materials

Procedure
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Wildlife Habitat

SUBJECTS
Mathematics
Science

GRADES
7-12

PLT PRINCIPLES
6. Life-Support Systems
5. Management and Interdependence of Natural Resources

CONCEPTS
6.42 Carrying Capacity
6.421 Limiting Factors in Environments
5.1 Interdependence of Resources
5.22 Wildlife as a Renewable Resource

SKILL
1. Gaining Information

OBJECTIVE

Students will be able to calculate the area of a triangle to determine the carrying capacity of a habitat for deer.

ACTIVITY

Using the map of the area and information provided, students may calculate answers to the problems listed. (Forage refers to vegetation taken naturally by herbivorous animals, both wild and domestic.)

Note: You may want to have part of the class use metric measures and compare the ease of calculations. An area of 1.6 x .8 kilometers will be approximately equivalent to the one shown.

Given:

One acre of meadow can produce 500 pounds of forage per year, (one hectare can produce 563 kilograms).

One acre of chaparral can produce 300 pounds of forage/year (one hectare, 338 kilograms).

One acre of forest can produce 100 pounds of forage/year (one hectare, 113 kilograms).

One adult deer requires 3,650 pounds (1,652.5 kilograms) of forage/year and for the purposes of this problem, 53 percent of this forage comes from chaparral, 39 percent from meadow, and the remainder from forest.

Note: These figures are realistic but will vary widely, depending upon local conditions, such as rainfall, latitude, etc.

Problems:

1. How many deer could be supported on the area shown? Conversion factor: one acre = 10 square chains.
2. How could vegetation be manipulated if your goal was to support a larger deer population?
3. What percentage of this deer habitat would be lost if the proposed highway is built? How many fewer deer would be supported in this area?
4. If the deer need chaparral, meadow and forest vegetation, how many deer can live east of the highway? What percentage of the total herd would the highway theoretically eliminate?
5. What percentage of this deer habitat would be lost if the proposed summer homes were built? (The development takes up one-eighth of the forest.) How many deer would be eliminated, theoretically, by the summer home development?

(Continued)

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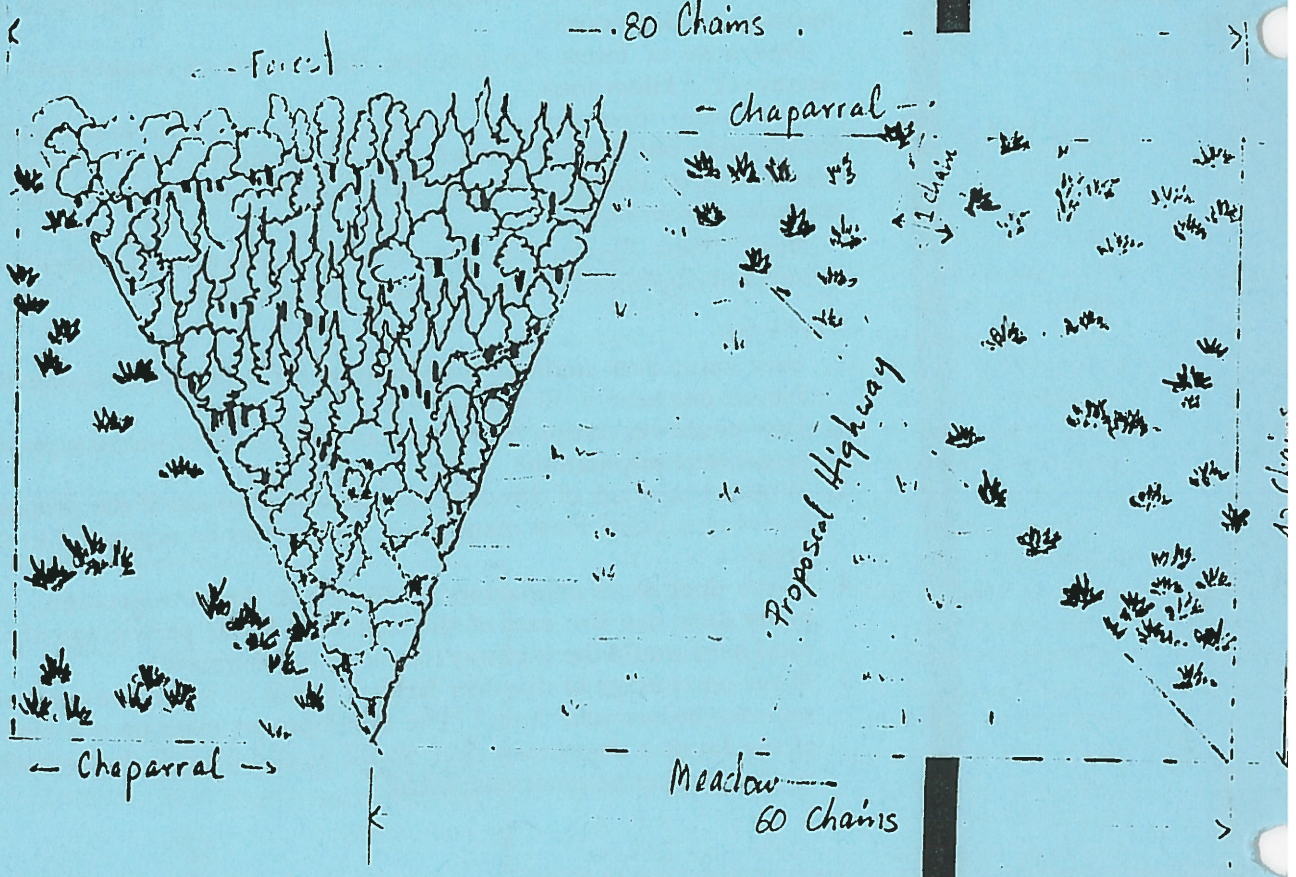
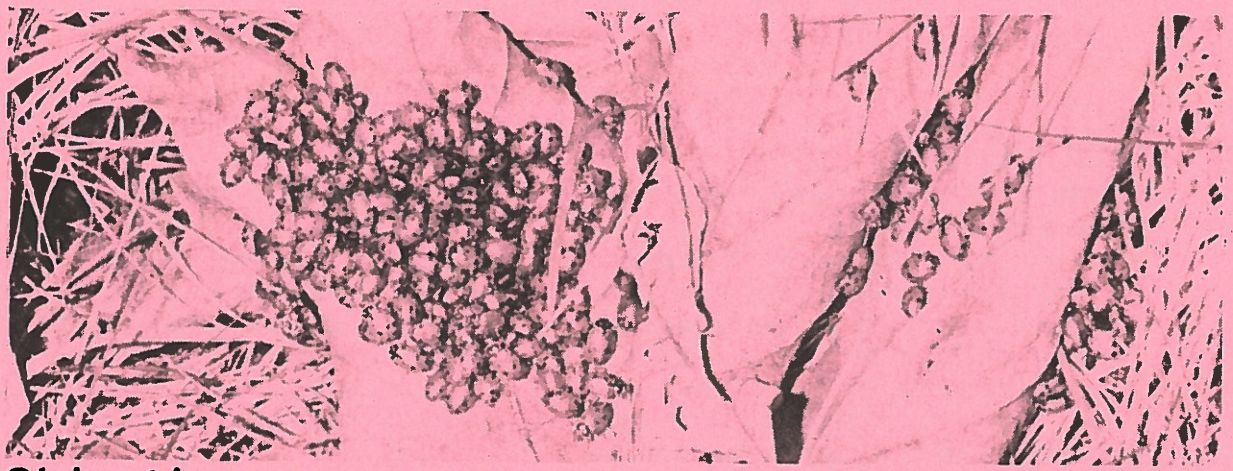
6. What vegetative changes would be likely to occur if the timber were harvested by clearcutting? Partial cutting? Section cutting? Shelterwood cutting? (see Glossary and consult local timber and other resource management personnel for definitions of these terms.) What effects would these vegetative changes be likely to have on the total deer herd? What effects might these vegetative changes have on watersheds? On habitat for other plant and animal populations?
7. If you were a Forest Ranger, managing the forest for timber production, and the deer herd increased, what effect might this have on new tree seedlings? What actions might you recommend? What advantages and disadvantages might there be to any action taken?



WILDLIFE IS EVERYWHERE!



Objectives

Students will be able to: 1) state that humans and wildlife share environments; and 2) generalize that wildlife is present in areas all over the earth.

Method

Students search their environment for evidence of wildlife.

Background

People often think of wildlife only as large animals like those they see in pictures of Africa, with lions and elephants. They might think of creatures of the North American forests that they have seen themselves, like deer and elk. But wildlife includes all animals that have not been domesticated by people.

Domesticated animals are those which have been tamed, made captive and bred for special purposes. Farm animals and pets are considered domesticated animals. (See "What's Wild?" and "Animal Charades.")

Wild animals are all the rest. What may be surprising is that wildlife includes the smallest animal organisms—even those that can be seen only through a microscope. Spiders, insects, reptiles, worms, and most species of fish, birds, and mammals may be considered wildlife. Wildlife occurs in a tremendous variety of forms and colors. And wildlife can be found all around us. Even when we think we can see or hear no animals at all—they exist somewhere around us—maybe even under our feet! There are even tens of thousands of life forms on our skin, in our hair, and inside our bodies! In fact, each of us would die if all the organisms that inhabit our bodies were to disappear. People are never truly alone in an environment. Some form of wildlife is near.

The major purpose of this activity is for students to understand that people and wildlife share environments. By investigating microenvironments or microhabitats, the students should be encouraged to generalize from the information they acquire to the entire planet, coming to the understanding that wildlife exists in some form in all areas of the planet. In the deserts of the southern hemisphere; the oceans, tropical jungles, and cities of the earth; from the Antarctic snow fields to the glaciers of the Arctic region, wildlife exists in a variety of forms.

Materials

string (optional)

Age: Grades K-3 (and older)
Subjects: Science, Language Arts
Skills: analysis, discussion, generalization, observation
Duration: 30 to 45 minutes
Group Size: any
Setting: indoors and outdoors
Curriculum Framework Reference: I.B., I.B.1, I.B.3.
Key Vocabulary: wildlife, wild, domesticated, environment, evidence

Procedure

CAUTION: Ask students to observe but not touch or disturb animals they see.

1. Invite your students to explore the classroom, looking for signs of wildlife. Even in the most cleanly-swept classrooms, you can usually find some signs of life—either past or present. It might be a spider web, dead insects near lights, or insect holes along baseboards and behind books. After the search and a discussion with the students about what—if anything—they found, introduce the idea that people and other animals share environments. Sometimes we don't even notice that we are sharing our environment with other living things, but we are.
2. Expand the search for other animals to the out-of-doors. Take the students on the school grounds and give everyone, working in pairs, five minutes to find an animal or some sign that an animal had been there. Look for indirect evidence, such as tracks, webs, droppings, feathers, and nests. (Be sure not to harm or seriously disturb anything.) After five minutes, sit down and talk about what everyone found.

Or, in advance, create a wildlife trail for your students to follow—looking for signs of animals along the way—by placing a long piece of string around an area of the school grounds and "salting" the path along the string with evidence of animals: bones, feathers, etc. The students can explore the trail in a "follow the leader" fashion. The students should remain quiet, observing to themselves. At the end of the trail, everyone should sit and discuss what they saw.

3. Talk with the children about what they learned. Emphasize that they have seen that people and wildlife share environments. They have seen evidence of wildlife at their school. Ask the children to guess whether they think different kinds of animals are found all over the earth—in the deserts, oceans, mountains, and cities. They may harvest their own experiences and talk about places they have been and have seen animals. Encourage the students to make the generalization that wildlife is present all over the earth.

Extensions

1. Survey your yard, kitchen, neighborhood, or city park . . . looking for wildlife.
2. Search magazines and books for wildlife from all over the planet.
3. "Invent" names and describe the wildlife found outside during searches. Older students can observe the animals, write a written description —and then check their invented names and descriptions against the scientific names and information found in reference materials.

Evaluation

In which of the following places would you be likely to find animals living? in a forest; in a hot, dry, desert; in a lake; at the top of a mountain; at the North Pole; in New York City. What kinds of animals might you find in these places? Name any areas on earth where you couldn't find any animals.

Name the things you saw, heard, or smelled which showed you that wildlife lives in the classroom and on the schoolgrounds.

Special / Quiet Spot Activities

Chapter Eleven

"MAGIC SPOTS"

OR

"SPECIAL SPOTS"

OR

"QUIET SPOTS"

OK

???

The youngster sits alone, leaning comfortably against a tree trunk. He is by himself, but he knows that his friends and counselor are not far away. There is no sound of human voices, no noise but the murmurings of the branches in the wind, birds singing, a stream meandering on its way, a single leaf scuttling along the ground. He comes here each day to his own special spot in the forest to pause and rest, to ponder and dream. He looks up to see the pattern of the branches of "his" tree against the sky, leans back to feel its bark against his skin, reaches out to touch the soil at its roots. This is his Magic Spot.

Magic Spot time provides the opportunity for each youngster to develop this easy, quiet relationship with one particular place in the natural world. To help the kids along, there are suggestions in their Logs for what they could do each day during the fifteen minutes or so that they spend at their spots.

On the first day, each youngster selects a personal Magic Spot, a secret place known only to the kid and the counselor. After Touch the Earth, the youngsters go out by class groups, each to a different area. A counselor takes a smaller group of five youngsters from the class to help them find their spots. The counselor will return with them to this area each day.

Before they select their spots, however, the idea of the Magic Spot is carefully explained. They are cautioned to be very careful about selecting one small spot from so many possibilities. "Your spot should be out of sight and hearing from spots chosen by others, if possible," Jim suggests. "It should be a place where you can sit comfortably, with a good tree or stump to lean against." He tells them to look in their Logs for a number of suggestions about what they can do during this time. "You don't have to do those

things, though," he notes. "Those are to help you become familiar with your spot. But Magic Spot time is a time to sit quietly and alone—that's the one overriding guideline here."

For the first day at the Magic Spot, Jim suggests applying some of the sensing techniques practiced during Touch the Earth. Looking at small things, smelling and listening, searching for patterns of light and shadow, and looking at the forest from different angles are a few of the possibilities. Sitting there, the youngster is encouraged to imagine the full picture—a boy or girl sitting under a tree, the entire forest, the planet whirling through space around the sun, as in the movie presented in the sunship room. On the first day, the idea is to get acquainted with this one small spot and to begin to develop a feeling for how it fits in as part of the larger sunship.

Log inputs include suggestions for exercises which will help the youngsters listen to the sounds, scrutinize the small things, and focus on the many scenes of their Magic Spots. A very special technique for one of these times is called "Seton-watching," which Jim explains to his group on Tuesday afternoon.

"Today at your Magic Spot, try some Seton-watching. Ernest Thompson Seton was a great artist and writer in the early 1900s, who based his paintings and stories about nature on the countless hours he spent observing the natural world. We named this activity after him because it's a good way to get to know a lot of the plants and animals in your spot." Then Jim tells a story of a time when he was Seton-watching and a squirrel came up and sat right next to his foot: "I was so still and quiet that that squirrel didn't even pay any attention to me. When you sit very still and quiet, the natural world just sort of settles down around you like you're not even there. You may not see animals, but you're more likely to. And you're more likely to feel a lot of other things, besides.

"The best way to do Seton-watching is to find a tree or stump to lean up against so you can sit still for a long time. Sit down, then make sure you are comfortable. Sort of run through your muscles with your mind and see if there is any pressure," Jim says, demonstrating. "Then, when you're completely comfortable, take a couple of deep breaths and relax. As you breathe, settle into a state of motionlessness. Don't move at all, but don't strain. Just relax. Let the natural world sweep over you and engulf you."

Then he takes them to their Magic Spots, where they try Seton-watching. Some see birds, animals, insects; some see falling leaves. They may see what goes on in their secret places when they are not there. Most importantly, they begin to feel the flow of life around them.

At the end of Magic Spot time each day, a horn or conch shell is sounded to tell the youngsters that the counselor will soon be coming down the trail to have them join him. In the meantime, they have spent a part of their day in a quiet place, where each is alone with his or her personal thoughts. Magic Spots provide a good environment for the kids to make the connection between the problems of the entire planet and this one special place they have

begun to value. The more they get to know this one place, the more they will respect and remember one small piece of the natural systems of Sunship Earth.

MAGIC SPOTS—GUIDELINES

GENERAL NOTES:

1. The success of this activity depends upon the location of the Magic Spots. Station leaders should guide their class group to a specific area. Subgroups should be formed with a crew counselor in charge. Each subgroup should be assigned an area where individuals can choose their spots. The crew counselors should check where the kids are located, then find their own spots. None of the spots should be within view of another.
2. Before the initial Magic Spot time, the station leaders should set the stage:
   + Talk in a hushed voice to set the tone.
   + Ask the counselors to make a pact with their group not to infringe on the rights of fellow group members by talking, moving around, hooting, or whistling.
   + Explain the signal for the end of Magic Spots. If possible, use a conch horn. When it is sounded, everyone should check in with the counselor.
   + Suggest possible places to locate a Magic Spot—on a stump, up against a tree, perched in a windfall, or beside a stream.
3. Before the first few Magic Spot sessions, the station leader should discuss with the group suggestions for things they might think about or do while at their spots.
4. If the woods or fields are wet, ask the kids to bring their raincoats to sit on.
5. In some cases you may find one or two kids who aren't ready for a solitary experience. Give them the option to spend some time at the Outlook Inn instead.

BACK TO BACK OBSERVATION

OBJECTIVE: - To develop ability to describe precisely. To develop use of analogies in describing things.

TIME: - 30 minutes

SEASON: - Any

LOCATION: - Any

MATERIALS: - 2 bags of identical natural materials (5 per bag)

PROCEDURE:

Divide into two groups, each with backs to the other group. Give each group a bag of items to spread out in front of them.

One group starts by selecting an item, describing it so the second group can pick it out of their identical items. Then group No. 1 explains exactly how to place the item on the floor and group No. 2 must place their identical item in an identical position.

Group No. 1 then selects another item, describes it to group No. 2, and explains how to place it in relation to the previous item. Continue until group No. 2 has placed all their objects on the floor. Then compare to see if Group 2's objects are in the same relative position as Group 1's objects. Trade roles and use different objects.

Rules for describing:

MAY NOT USE	MAY USE
name	size
color	shape
material	feel
	odor

This activity may also be done with different items of varying descriptive difficulty such as 5 different leaves, all kinds of rocks, 5 flowers--of different species or kinds.

BUT

OBJECTIVE: - A story for our hands to tell.

This is a plant

So new and small

That it hardly shows

In the moonlight at all -

but

This is a rabbit

Hopping, hopping

He smells the plant

And now he's stopping -

but

There sits an owl

With great big eyes

He sees the rabbit

And silently flies -

but

Here comes a fox

Not missing a sound

He gets ready to pounce

When the owl strikes the ground -

but

Here comes the farmer,

Looking things over

He gives a whistle

To his big dog Rover -

So -

The fox slinks away

The big owl goes

The rabbit hops home

The plant just grows.

SNAG CINQUAIN

OBJECTIVE: - To increase the child's abilities of observation and creativity.

CONCEPT: - Objects, in this case snags, which seem dead and worthless have a purpose.

TIME: - 30 minutes

SEASON: - Anytime

LOCATION: - A forest or anyplace in which a snag can be found

NUMBER: - 8 participants

MATERIALS: - A snag in the forest and a pencil and paper for each child.

PROCEDURE:

Have the children observe the snag by feeling it, smelling, looking. Observe all details about it and then write a cinquain about the snag:

1. word to name the subject _____
2. words to describe it _____
3. words of action about it _____
4. word phrases about it (in this case what the snag means to the rest of the environment) _____ _____ _____ _____
5. word that sums up the subject _____

SOURCE: - Class resource material: Language and Art Activities in the Outdoor Environment.

CINQUAIN POETRY

OBJECTIVE: - To introduce an easy, enjoyable writing experience utilizing the outdoors.

TIME: - 30 minutes

SEASON:

LOCATION: - Anywhere

MATERIALS: - Pencil and paper

PROCEDURE:

Have the students observe some features in the outdoors. Compose a cinquain as a group and then let individuals try their skills.

The cinquain form is as follows:

raccoon	1 word naming your subject
playful, funny	2 words describing subject
creeps slowly onward	3 words of action
silently stalks the grasshopper	4 words of activity, effect
hunter	1 word that is a synonym for the subject, or a summary

Share the poems and/or display them.

HAIKU POETRY

OBJECTIVE: - To introduce an easy, enjoyable writing experience about the outdoors. To use syllables to write a poem about nature.

TIME: - 30 minutes or more

SEASON: - Any

LOCATION: - Anywhere

MATERIALS: - Pencils and paper

PROCEDURE:

The haiku is a form of Japanese poetry about nature. It need not rhyme. It is based on numbers of syllables in each of three lines:

WINTER

The star studded tree	5 syllables
Shivers in the pale moonlight	7 syllables
The wind rushes by	5 syllables

After writing, it is fun to illustrate the poems with sketches or pen and ink drawings.

COMMUNICATION DRAWING

OBJECTIVE: - The participant will develop an awareness of the communicative skill of "question asking" as well as an awareness of the detail to be found in a leaf.

CONCEPT: - Communication is a two-way process.

TIME: - Approximately 20 minutes

LOCATION: - This activity can take place in practically any setting.

MATERIALS: - Paper and pencil for each participant
Two different types of leaves for each group (a group consists of two people)

PROCEDURE:

The entire group is divided into pairs. In each pair, one person is labeled the "communicator"; the other, the "artist."

The communicator and the artist sit back-to-back. The artist has pencil and paper in order to draw a leaf that the communicator will describe. The activity leader gives each communicator a leaf to describe to the artist without the artist seeing the leaf.

During the first phase of the activity, the artists cannot ask any questions. They must simply draw the leaf from the description given by the communicator.

After approximately 10 minutes, or when most people seem to be finished, have everyone take a look at the pictures. Now, swap roles. The communicator is now the artist and the artist becomes the communicator. This time, however, the artist may ask questions during the activity.

When everybody seems to have completed his or her drawing, take a look at the art work and compare the two sketches. Which is better? Why? What does this tell us about communications?

SAFETY: - This isn't what one would normally call a "high risk" activity, although there might be some hazard in the types of leaves one selects, i.e., poison ivy, poison oak, poison sumac, etc.

DIAMANTE

OBJECTIVE: - The participant will learn a poetry form, which will connect them with the natural world.

CONCEPT: - Communications

TIME: - 15-30 minutes

LOCATION: - Any quiet place where participants can think and not be distracted.

MATERIALS: - Pencils and paper, one for each person or each group.

PROCEDURES:

A diamante is a poetry form in the shape of a diamond. Pick two nouns that are opposites (antonyms). These two nouns will be the top and bottom of the poem. All the rest of the words will fit inside (between these two) and be related. For line two, pick two adjectives that relate to the top noun. Line three, pick three participles (a verb + ing) that relate to line 1. Line 4, four nouns that relate to both line 1 and line 7. Line 5 is three particles relating to line 7. Line 6 is two adjectives relating to line 7.

When it is finished it should look like a diamond.

This can be done by individuals or in small groups up to 3 or 4. The topic can vary. Nature is just a very timely topic.

moon

pale, weak

glowing, shimmering, waning

rest, strength, life, growth

shining, warming, waking

bright, strong

sun

CREATIVE WRITING EXPERIENCE

OBJECTIVE: - For students to translate what they experience with their five senses into words.

CONCEPT: - We can better learn to communicate what we experience through our five senses.

TIME: - 30 minutes to 1 hour

SEASON: - Any, mild weather

LOCATION: - The bank of a fast-flowing creek

NUMBER: - Any number, but insure minimum impact to the site

MATERIALS: - Paper, pencil, book to write on

PROCEDURE:

Each student finds a comfortable spot and sits quietly by the stream bank. S/he lists the five senses and then writes down words to describe his or her sensations. VARIATIONS: Have students categorize sounds as natural or man-made; develop as a poetry exercise and have them write a cinquain.

SAFETY: - Check their proximity to the water.

SOURCE: - Environmentally Related Programs for the 1st Grade, Angelyn Shafer, Huxley College Center for Environmental Education.

DRAWING RELAY

OBJECTIVE: - The participant will learn that communication can occur in manners other than verbal language. Drawing is the specific form.

CONCEPT: - Communication and Art Forms

TIME: - Approximately twenty minutes (depending on size of groups)

LOCATION: - Anywhere with flat ground or floor. May be indoors if it is raining outdoors. Large area so groups can spread out.

SEASON: - No preference

NUMBER: - Not a prime number. They will need to be divided into equal size groups (five is a good number for the size of the groups). Probably four groups is maximum for good control.

MATERIALS: - Construction paper (equal to the number of participants
Pencils (one per group, plus one or two for spares for emergencies)

PROCEDURES:

1. Arrange the students into groups of five, having each group sit on the floor in a circle.
2. Place one pencil and some paper in the center of each circle.
3. Number the students in each circle from "1" to "5" (seat yourself away from the circle of students).
4. When the signal is given, the first student from each circle comes to you (he/she is not to bring their pencils with them).
5. Tell each one the name of the first item on the list.
6. Each student returns to their respective circle, takes the pencil in the center and draws (without talking) the item until someone in the circle correctly identifies it.
7. The second person in the circle comes to you and tells you what the group has determined the item is.
8. You then give that student a new object or item to draw, etc.
9. A sample list of objects or items follows: Frog, Tree, Fire, Bird, Sun, Soil, Deer. Generate a list of about twenty items.
10. Remind the students that if they "yell out" what is being drawn in their circle, everyone in the other circles will hear.
11. This is an excellent rainy day activity or cooling off activity. Be sure to display the drawings after the game.

SAFETY: - Insist that pencils remain with group and are not carried around with the runner. There could be risk if they are allowed to run with the pencils in their hands.

LEAF RUBBINGS

OBJECTIVE: - Students will demonstrate the ability to perform leaf rubbings.

CONCEPTS: - There are many kinds of plants with leaves of varied shapes and sizes (similarities and differences).

TIME: - From 20 minutes to an hour (the activity can also be done in the participants' free time)

LOCATION: - Any area with many different types of plants

SEASON: - Late spring and summer is best

NUMBER: - Any number

MATERIALS: - Thin paper, a flat surface, leaves (to be collected by the student), and natural rubbing materials (charcoal, fleshy leaves, bark, soil, etc.).

PROCEDURE:

1. Explain that there are many kinds of plants with leaves of varied shapes and sizes.
2. Instruct participants to collect different leaves and natural drawing materials to make rubbings of the leaves.
3. The rubbing process
   - Place a leaf vein side up on a flat surface.
   - Place a sheet of paper over the leaf and hold firmly in place.
   - With the other hand, rub the charcoal or other rubbing material in parallel strokes over the leaf. The outline and venation of the leafs will appear on the paper.
4. A booklet of rubbings can be compiled.

SAFETY: - Avoid poison oak, ivy & sumac

SOURCE: - Student files
Submitted by Steven J. Hollenhorst for RPM 490, Spring 1981

RAINBOW HUNT

OBJECTIVE: - The participants will be able to identify several types of soils according to color and texture.

CONCEPT: - There are many kinds of soil.

TIME: - Thirty minutes

LOCATION: - This activity is best when conducted in an area with a variety of soils.

SEASON: - Spring or summer is probably best. Any time when the ground is not frozen.

NUMBER: - Between six and eight is ideal

MATERIALS: - A small trowel

PROCEDURE:

This activity does not create anything of a lasting nature in terms of art. It is strictly an observation activity where participants observe various colors of soil, dig in it, feel it, rub their hands in it, smell it, etc.

Look at the various colors of soil. Why are they different? Why is some soil red, yellow, gray, black, brown, etc.? Are some of the colors pretty? How many different colors of soil can be found in your area?

17

SENSORY CIRCLE

OBJECTIVE: - Sensory appreciation

To teach people that all senses must be used when studying the outdoors

To realize that each person interprets objects in his/her own way

To understand that all answers can be correct

TIME: - Spend only as much time as interest is held (will vary with different age groups)

SEASON: - Preferably during dry weather

LOCATION: - A forest, meadow, field, anyplace (preferably outside)

MATERIALS: - Blindfolds; objects to be sensed (pertaining to nature; i.e., rock, bone, etc.)

PROCEDURE:

Create a feeling of excitement, "We are about to enter a very special place where your senses will be stretched."

After sitting in a circle, tell them to soak up the situation, then put on their blindfolds; sit blindfolded for awhile. As you pass around the object have each person contribute a description using one sense, but don't tell if you've discovered what it is.

After going around, have each guess--if no one guesses, go around again. Save tasting object to last, giving each person his/her own piece.

QUESTIONS:

Do you notice any differences in your other senses now that you can't see?

Which sense tells you the most? The least?

Do you really get an adequate idea from other people's descriptions?

SNOW PAINTING

OBJECTIVE: - The participant will appreciate a different art form by creating a painting in the snow.

CONCEPT: - Snow is a source of water.

TIME: - Twenty to thirty minutes

LOCATION: - Winter setting where there is plenty of snow

SEASON: - Winter

NUMBER: - Small group, six to eight at most

MATERIALS: - Various colors of powdered tempera paint (water based)
Several shaker containers

PROCEDURE:

It's fun to use powdered tempera paint in a shaker container to create a small picture in the snow.

The powdered paint can be placed in a salt shaker or babyfood jar with a hole or two punched in the top.

A day without wind is necessary to avoid having the paint land on the children.

A small area is selected where the children can create the painting. Small, delicate shakes are best and don't create an eyesore.

SAFETY: - Standard winter camp safety, i.e., knowledge of hypothermia, frostbite, etc.

SPECIAL ACTIVTIES

ENVIRONMENTAL EDUCATION

Evening Games & "Fill-in" Activities

I. LOMC has the equipment to do the enclosed games.

Parachute
Earthball

II. Other "typical" sports may also be done. LOMC has this equipment.

Softball
Volleyball
Frisbee
Touch Football

III. Sequencing of Evening Games.

A. Begin with a moderately active game(s).
Pruie? Pruie?
Snake in the Grass
Hug Tag
Roll Over, Beethoven

B. Secondly, move to very active game(s).
Parachute Madness
Blob
"Typical" sports

C. Thirdly, progress to a more "contemplative" game(s).
Unravelling
Human Pyramids
Who's In Charge?

D. Finally, finish up with a very quiet/inactive game.
Stand-Off
The Last Detail

IV. Need more help/ideas? See an LOMC staff person.

Blob

If you're addicted to late-night TV monster movies, here's a sure way to kick the habit and break out into the light of day. We must warn you, however, that you will not avoid being swallowed up by—the Blob.

The Blob begins innocently enough as a mere individual playing a game of tag. As soon as she catches someone, she joins hands with him. Now he's part of the Blob, too, and they both set out, hand-in-hand, in search of victims. Everyone the Blob catches (only the outside hand on either end of the Blob can snatch at players) joins hands with it and becomes part of the lengthening protoplasmic chain. And thus the insidious Blob keeps growing.

Unlike your run-of-the-mill, mad scientist-created Blobs, this one is not content merely to ooze along, seeking its prey. It gallops around the field, cornering stray runners and forcing them to join up. (You'll have to agree on boundaries for this game; some people will go to any lengths to avoid meeting an untimely end at the hands of the primordial slime.)

Moreover (horrors), the Blob can split itself into parts and, with its superior communal intelligence, organize raiding parties on the lone few who have managed to escape. The thrilling climax occurs when there's only one player left to put up a heroic last-ditch stand on behalf of humanity. But alas, there is no defense against the Blob, and humanity succumbs. (If that seems unfair, well, that's the plot.)

The moral of our story could well be, "You become what you fear." If you have the heart to destroy humanity again, you can have the last person caught start the Blob for the next game. ■

Last Detail

With most New Games, we don't have to concern ourselves with the precise rules. We can adapt this detective game to different situations too, but it's definitely one in which we have to be sticklers for detail.

We start by facing each other (one to one or team to team) and remaining still for two or three minutes. But we should not let the time pass idly; instead, we should be doing our best to observe and remember as much as we can about the person facing us.

We then turn our backs to each other and change six details about the way we look—details that can be seen without the need to touch or move anything. Once rearranged, we turn back to face each other and see whether we can spot all the changes in our partners.

That sneaky fellow in the photos has changed his appearance in six ways. Can you spot every last detail? ■

eyes straight ahead, relying on your peripheral vision, and your *sense* of what your thumbs are doing.

UNRAVELLING

A group of 10 to 20 people is ideal for this game. (Larger numbers can be subdivided into groups of this size.)

The group gathers together in a tight circle, arms outstretched. In the sea of available hands, each person finds two to grasp. (Check to be sure the hands belong to two different people.)

Now, without letting go, try to unravel the chain into a big circle. Players may duck under the chain or step over it. The group is also allowed one application of "knot-aid" — a quick letting go and hooking up again — to deal with an especially bad tangle.

The results will surprise you. Sometimes you get one big circle; sometimes a figure eight; sometimes two, three, or more independent circles. Some people will end up facing into the circle, some people facing out.

HUMAN PYRAMIDS

Three people can make a pyramid. So can six, and (maybe) ten. There are no rules for this game, but experience shows that you put your beefiest players on the bottom, the smallest on top. No knees directly over spines, please!

PRUIE? PRUIE!

A group of ten or more people gathers together in a loose array. A referee explains the rules: The object of the game is to find the "Pruie" (pronounced "proo-EE"). To do this you first close your eyes. (When everyone's eyes are closed, the referee picks someone to be the beginning of the Pruie.) Then everyone begins to mill around. If you touch someone, reach out, shake their hand, and ask them the question: "Pruie?"

If your answer comes back "Pruie!," then you have *not* found the Pruie. If you receive no answer at all, but the person continues to hold your hand, then you have found the Pruie. Congratulations!

When you find the Pruie, you become part of the Corporate Pruie, and you stay where you are. If someone shakes your free hand, do not reply, but continue to hold on to their hand. When everyone is part of the Pruie, the referee calls for everyone to open their eyes.

(Thanks to Bernie De Koven.)

SNAKE IN THE GRASS

This game was brought to the first New Games Tournament by a ten-year-old boy. Any number can play.

To start, the player who's "it" lies down in the grass and "becomes" a snake. All other players must make contact with the snake. At a signal (can be given by the snake or a referee) everyone jumps back trying not to be touched by the snake. Anyone touched becomes a snake too. The game continues until everyone is a snake.

WHO'S IN CHARGE?

A group of 5 to 20 people forms a circle and chooses a referee. One person volunteers to be "it." "It" stands in the center of the circle, with eyes closed, while the referee picks someone in the circle to be the leader.

The leader starts a repetitive movement, clapping hands, thumbing a nose, marching in place, etc., which everyone else in the circle must follow. "It" opens his or her eyes, and tries to determine who is leading the group. The leader must change the movement regularly, but always when "it's" back is turned, so as not to be caught in the act of changing.

To make the game more challenging, players should avoid looking direct the leader.

When "it" either names the leader, o uses up three guesses, the leader bec "it" for the next game, and takes a p in the center of the circle.

HUG TAG

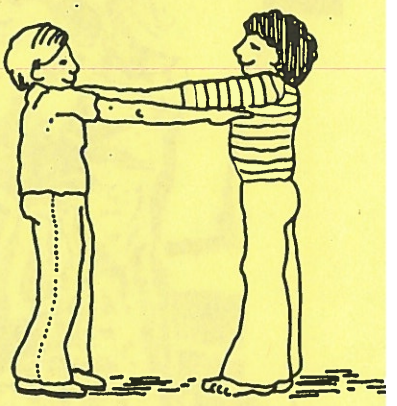
This can be played with any number people. The simple rules are: Any g of two players hugging (or holding h are a "free zone," and cannot be tag Players may start and stop hugging e other whenever they want.

The person who's "it" can hug peopl too. But you're still "it" until you f somebody who's unhugged and tag t

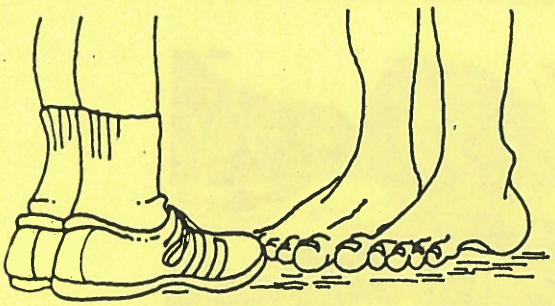
(Thanks to Larry Diamond.)

STAND-OFF

Two players face each other at arm's length. (Use the shorter person's arm for the measurement.)



The feet of each player must be side side, toes and heels touching.



Players stand with knees and elbows slightly bent. Palms are toward the opposing player, about shoulder-width apart. The object of the game is to strike the other player's palms with yours. You score a point if you can push your partner off balance, causing them to move either foot. You, of course, must remain standing. You may also score by dodging one of your partner's thrusts, so that they lose balance and fall forward onto you. All kinds of faking and feinting movements are allowed.

One point is a game. The match is won by the player who takes two out of three games.

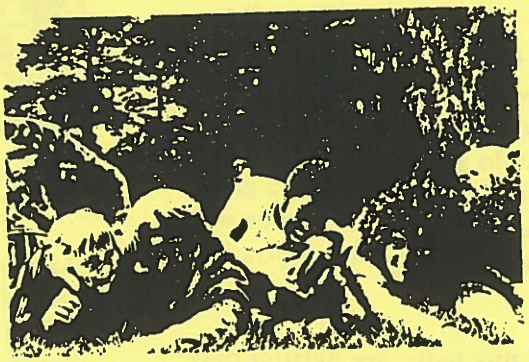
Note: The winner of a match may beat his or her chest and roar like a gorilla. (But this is optional.)

(Thanks to Scott Beach, Intergalactic Champion of Stand-Off.)

ROLL OVER, BEETHOVEN

This is a funny game that allows people to get very close together.

Any number can begin this game by simply lying, face down, on the ground. Scrunch together as tight as possible so there are no gaps; get to know your neighbors. Play begins with the person on one end of the line rolling over everybody to get to the other end. The game continues at least until everybody has had one roll.



THE HUMAN CENTIPEDE

This game needs at least 30 people. Players stand close together in a line that's three people wide, and ten or more people long. Players must not be shy; this is like a crowd in a subway — really packed in tight. A few other players, "side coaches," should stand at either side of the group to help keep it bunched together.

Play begins when one of the first people in the line is hoisted up onto the hands of the group, and passed, in a horizontal position, to the back of the line. When

PARACHUTE MADNESS

While searching through your local surplus stores for a ship's hawser, keep an eye peeled for a used parachute. There are lots of them around, so you can afford to be selective. Check to be sure the parachute is a flat one. Nylon chutes are best because they're light. There's a whole range of sizes and colors, and the prices vary widely, from $15.00 to $60.00 or more. But a parachute will last a long time. If you do get a tear, patch it right away, before the tear becomes a gash. You can make a temporary repair with tape and then sew it up when you have time.

Parachutes, like balls, are natural playthings, full of possibilities for all kinds of games. Here are just a few to get you started:

Put as many people as you can comfortably fit around the edge of the parachute. Everyone grabs on to the edge, and lifts it into the air.

Now throw an Earth Ball (see below), or several big beach balls onto the parachute.

Cooperate to pull the chute so as to make "waves." The idea is to work together to keep the balls rolling around on the parachute. Balls that start to go out can be batted back in with hands and arms.

Another game is to have everybody grab the edge of the chute, quickly raise it up in the air, and, *while still holding the edge*, run under it. Quickly sit down on the edge as the chute settles down on your heads. Now lean back against the taut fabric and begin to sway your bodies back and forth. The parachute will take up an absolutely eerie movement.

Parachutes are also fun to run under and over.

GET-ACQUAINTED

Lutheran Outdoor Ministries Center Environmental Education
Oregon, IL

GRADE LEVELS — The leader should be the best judge of that. The books noted below often include suggestions of appropriate age/grade levels.

GROUP SIZE — up to 15

LOCATIONS — Outdoors is best. Indoors is acceptable.

SUPPLIES — As noted for each activity in the suggested books.

OBJECTIVES — For the participants to learn the names and basic characteristics or likes/dislikes of the other group members; for the leader to learn about each group member; for the participants to learn about their leader, to know his/her name, and to become comfortable with him/her.

METHOD — No matter what is done, the leader should first instruct the participants in the activity and then join in. The participants want to know about you,too, and who they are going to trust. Be open with them.

Sometimes it helps to afford a quiet time after the get-acquainted games and mixers for the leader to say some things about him-/herself (why am I doing this, where do I live, what do I like). Then allow several minutes for the participants to ask you questions.

RESOURCES — There are many resources for mixers in the LOMC Resource Center. Here are just a few.

New Games
More New Games
Clouds on the Clothesline
Playfair
For the Fun of It!
Guide for Recreation Leaders
Initiative Tasks and Games
Cowstails and Cobras

You can also try one of the many suggestions in "Mixers, Mixers, Mixers!" (attached).

NOTE TO LEADERS — These Get-Acquainted Activities should be some of the first things you do with the group participants. When done well, they will really help "set the stage" for an excellent experience at LOMC. However, after three or four of these activities (about 15 minutes), they become dull. Environmental Education Instructors should try to choose activities that relate to nature or the environment.

MIXERS, MIXERS, MIXERS!

Fictitious Name Charades - Prepare series of name tags with fictitious characters' names (eg. Samson and Delilah; Lady Godiva), or current movie stars, pop idols, song titles. Have groups of 4, and stick on the back of one person a name tag. The others in the group should look at the tag and pantomime the name until the person can guess who he is, Remember NO talking.

Wishing Game - Give everyone a chance to think how he would finish the following sentences: a. if I could take off for one month and money was no problem, I would like to go to . . . . .

b. if I could take along one friend who has meant a lot to me in the past, I would invite . . . because . . . .

c. While on the trip, I would like to goof off for a few days doing . . .

Get together in groups of 2 or 3 and share responses.

Human Machine - The group is to create a human machine in which each person becomes a part and sound, linking into the total group by way of physical contact. A person can be a piston that goes up and down (raise and lower hands) or a gear that goes round and round (move arms in circular motion). The challenge is to come up with original and creative motions. Everyone is to choose a motion, and then choose a sound to make that is consistent with the action. The challenge now is to interlink all the people. (design takes about 3-4 minutes; it just loosens everyone up).

Slap - Down - Three persons to a group. One person bends over at his waist and lets arms and head dangle. Two persons stand at the sides of the bent person and slap lightly up and down the 'loose body. Then increase slaps to a firm slap, and go up and down body. Do this at a moderate speed. Follow the same procedure rotating with the other 2 persons.

Poster exercise - Each person is given a magazine and told to tear out 5 or 10 things that especially strike him as significant or descriptive of concerns in his life. Everyone then chooses 3 most pressing concerns from these, and shares in small groups.

Sing - the funny action type songs that you know -- eg. Rise and Shine!

Yes/No - Prepare a list of fun questions that can be answered by yes or no, then fire them at the group, having them stand or sit for yes or no. e.g. Stand up if you brushed your teeth today. These can build up to more serious questions.

Art Charades - Use newsprint and magic markers to draw out song titles of pop songs or 'golden oldie' songs. Guess titles, compete for fastest time.

Complete Sentences - Each individual shares how he has completed the foll sentences: a. on Saturday I like to . . . b. If I had 24 hours to live . . c. If I had a million dollars I would . . . d. I feel best when people . . e. Secretly I wish . . . f. I like people who . . . . g. The hardest thing for me to do is . . .

Human lawn mover - Work as teams - each person has children's blunt scissors and is to CUT grass and put in container. Winner is the team with the most grass.

Reverse Scavenger Hunt - Try selling junk given at the meeting. Team with most money wins.

Blind Mate - Guy and girl are blindfolded and placed at opposite ends of room. They are to walk towards each other and shake hands without coaching from audience.

Indoor Scavenger Hunt - Teams . . . each appoints a leader . . staff calls out an item (use unusual things that the people probably have on them, like comb, red sock, 1970 penny, etc.), and the leader finds item among team mates First leader that brings item to staff gets 5 points.

Name Game - Have people get into line in alphabetical order of last names/ do it NONVERBALLY. Those in order get prize.

Balloon blast - several balloons are needed (150 to 200). One half of the crowd blows them up; and the other half keeps them in the air to establish a world record by the youth group.

Can the balloon - See who can stack the highest stack of empty pop cans before a dropped balloon hits the floor.

Nobody Nose - Stick noses through a hole in a sheet. One team has to identify the others who have their nose sticking through the sheet.

Standing Grin - Measure 'grins' to see who has the widest. Use a ruler.

Eye Spy - Everyone lists each person in the room according to eye color.

Kleenex blow - In small groups, without touching a kleenex, the group tries to keep the kleenex in the air the longest by blowing. Best time wins.

- -

Quick Draw Contest - One person holds an object and tries to describe it to another person who has a pen and paper and who must draw the object as it is being described. (Don't use words to give away what the object is).

QUICK Draw Contest - One person holds an object and tries to describe it to another person who has a pen and paper and who must draw the object as it is being described. (don't use words to give away what the object is).

Rubber Band Relay - Place an elastic band around one's head with it crossing over the tip of the nose. Try to maneuver elastic to the neck without using hands. Have a race to see who can do it first or do individually and see who has the best time.

Ideal Town - Work in groups of about 6. Each group is to construct what they would see as the ideal town, and indicate which business they are capable of running, which home they would like to live in etc. It is a way of finding out interests and ideas of people who you do not know. Draw the town as a group on a huge sheet of newsprint, or build in sand or with toys.

Cooperation - People all sit in a circle. One person leaves the room. The group then chooses a leader among themselves, who is to lead the group in hand and feet actions/movements. The people try to do the actions in unison, thereby trying to conceal who the leader is. The person who left the room is to try and guess who the leader is.

Senses - Leader places common everyday items throughout the room before every one arrives. The items are to be placed in plain sight, but don't make the items too obvious. Each person is given a sheet of paper with the items and is to check off the items when he sees them. First person finished wins. (Use items like stamp, pin, pencil, paper clip, eraser, etc.,)

Color your World - Ask everyone to pick four crayons that represent dominant colors in his life. Tell him to draw his world, i.e. draw a symbol for each of the major areas of his life, and use a color that reflects how he feels about this being a concern or major area of his life. (e.g. draw swimming pool if swimming is something he does daily or if he lifeguards; use the color red if he is happy about this being a concern). Then have each person color the background in the color that reflects his overall outlook on life. Share results!

Balloon Smash - Each person has a balloon tied at the waist, and has a rolled up newspaper. Purpose: Break everyone's balloon but keep your own from being broken. Last surviving balloon wins.

Scavenger Hunt - Use unique items like: oldest nickel; smelliest sock; biggest piece of wood; heaviest rock; most worn-out shoe; biggest leaf. Get awarded points for oldest, biggest, etc.

Paper bag wamp- each person has a paper bag loosely over his head down to his ears. Each person has a rolled up newspaper to try to knock the other person's hat off without loosing one's own. Last one to survive wins.

Nose balance: perticipants sit on chairs facing onlookers. They lean their heads back and place a penny on their nose. Purpose: without moving heads they are to wiggle the penny off nose. First to knock penny off wins.

Darling if you love me: People sit in a circle. One person is selected as "it." He must go to a female and say "Darling if you love me, won't you please please smile." She must reply without smiling "Darling, you know I love you but I just can't smile." If she smiles, she must go in the center, and the male gets to take her seat. If she does not smile, then the male must go try and make another female smile.

To Tell the Truth: Each person is to say four things about themselves and deliberately make one of the four things false. The group is then to guess which one is the false statement. (The statements can be on interests, skills, concerns, etc. the person has.)

Name Tag College: As people arrive, give them a magazine to leaf through and tear out five or six things that sum up how they are feeling or thinking at this moment. The tear outs are to somehow portray who you are and where you are at the moment. Paste the tear outs on construction paper, and get together with one other person to explain your college. Share more!

Possessions: In silence, look over the possession you have with you and select three things that you would classify as 'very valuable' to you either in themselves or as a symbol of your lifestyle. Explain selections, including the why, to someone you do not know well.

Two Questions: complete the following and share: 1. the thing in my life that gives me the most satisfaction at the moment is... because... 2. the thing that I long for in my life at the moment is...because...

Projection: everyone takes his age and divides it by one third and projects himself back to that year, when he was 2/3 the age he is right now. Think back to then and answer the following: a. what was the major interestiin your life? b. what was the major problem in your life? c. what was the major hope in your life? Everyone shares responses. Go around a second time and ask persons to respond to these questions for right now in life; go around and then ask for a response projecting intb the future the same number of years that he subtracted before.

ME IN THE OUTDOORS OR READY FOR NATURE

Lutheran Outdoor Ministries Center Environmental Education
Oregon, IL

GRADE LEVELS

Grades 2-7
(Grades K-1, 8-12, and adults will need a different approach than stated below. Younger people will have to have it simplified, older people will need to have it appeal to more of their intellect. Younger teens may need to have it made very active in order to keep their attention.)

GROUP SIZE

up to 15

LOCATION

Outdoors (best)	OR	Indoors (acceptable)
Special Spot of Group		Small meeting room
Intimate area in forest		Corner of large room

SUPPLIES & EQUIPMENT

The leader should have everything s/he will need to illustrate what the participants will need outdoors.* The supplies & equipment should reflect expected weather conditions and the learning activities. Such as:

- Daypack or Totebag
- Raingear
- Cold weather "add-on" clothes (i.e., sweat-shirt/sweater, gloves)
- Camera (optional)
- Bible (Christian groups only)
- Personal Compass (optional)
- Notebook, Notepad, or Journal
- Pen or Pencil

The leader also needs to carry his/her supplies that the participants need not have, such as:

- Curriculum or Lesson Plans
- Supplies needed for Activities or Lessons
- First Aid Kit
- Extra Clothing

OBJECTIVE

The participants will become prepared for outdoor activities that they will be experiencing while they are at LOMC.

PROCEDURE

1. After meeting the participants and becoming familiar with them (see GET ACQUAINTED plans), take them to the location of this activity.

2. Sit in a circle, and as they are doing so, introduce what you will be doing now. Explain that they, as a group and as individuals, need to be prepared for the out-of-doors and that they are going to learn how.

3. In the middle of the circle spread out all of the supplies or equipment that you have in your pack. Once this is done, let them talk for a minute or two about what you have laid in front of them. Then begin to explain everything systematically.

4. Take each article and one-by-one explain what it will be used for. Let them ask questions and answer them. When they/you are finished talking about an article, hand it on a nearby tree or bush for all to see clearly.

5. Have the participants spread about about 5' between each person. Have them empty their own packs and see if they have the articles that are hanging on the trees/bushes. Take note of who has and doesn't have what for use in step 7.

6. When you have gone through all the articles on the ground, give them a little suprise without saying anything! Take off one of your shoes, one sock, and the top layer(s) of your torso clothes (within reason and good taste!) Most likely they will laugh or cause some minor commotion. Explain to them that these clothing articles are very important for their enjoyment out-of-doors too: they aren't at home where they can go inside anytime they get hot/cold/wet. Explain the purpose for each item and what makes for good shoes/socks/shirts/hats/etc. As you finish talking about each item, put it back on. Ask them if their clothing will protect them from the elements. This is the time to check all the participants for proper attire.

7. If needed, return to the participants' retreat house or tent to get better or complete supplies and materials.

EXTENSION

Steps 4 and 6 are good spots to insert, at least casually if not moreso, what the activities are that you will be doing.

SUPPLEMENTARY ACTIVITIES

Orientation Hike Around LOMC
Special Spot Activities
Expectations and Contracting

* Please note that before you leave for the location of this activity each participant will need to have his/her pack. They will need to be directed to bring it.

NATURE BANNERS
LOMC EE

Objective: The students enjoy the use of natural items in the making of a small banner. The students use their artistic skills and talents. This project should be brought home.

Materials: large quantity of twine or string*
white glue*
scissors*
sticks (2 or more) per student, both 1'-2½' long
assortment of grasses, flowers, twigs, leaves, etc. (dried is best)
adhesive address labels (for names)

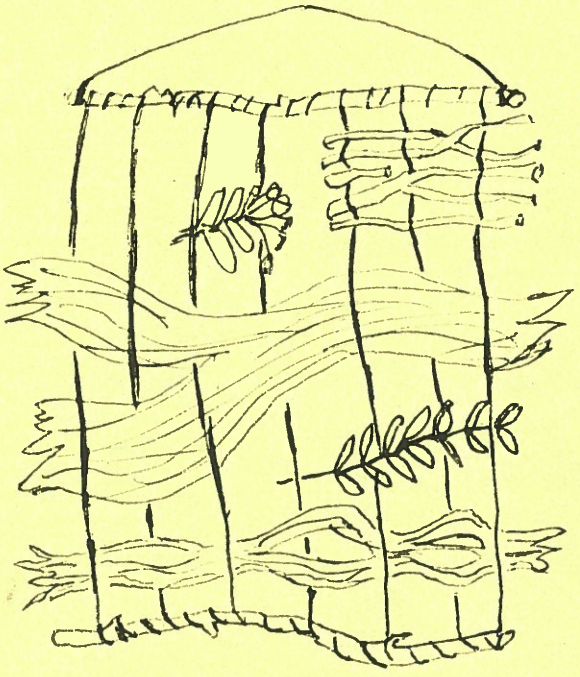
* The amount needed depends on the number of people in the group, the size of their banners, and exactly what they wish the banner to contain.

Safety:
+ Watch for misuse of the scissors.
+ Glue is not to be eaten.
+ Tangled twine on the ground/floor can be a tripping hazard.

Time: 45-120 minutes

Location: Summer: outdoors
Fall-Spring: indoors or in shelter where the students can sit and work comfortably

Method:
1) Introduce the activity and the end results. Give an example of the final outcome.
2) Have each student collect the natural materials they will need: sticks, grasses, flowers, twigs, leaves, etc.
3) Provide glue and scissors as needed by the students.
4) Students work on their project.
5) When the project is finished:
   a) tie twine for it to hang from a nail; and
   b) put name of each student on adhesive label and attach to their respective project.
6) Collect and box all projects for distribution later.



Source: Lutheran Outdoor Ministries Center, Oregon, IL (general practice)

LUTHERAN OUTDOOR MINISTRIES CENTER

STRESS CHALLENGE COURSE

The Stress/Challenge course is an exciting way to develop a sense of community in your group. The role of the leader is to give instructions regarding the task to be accomplished at each station. It is the responsibility of the GROUP to determine HOW THE TASK CAN BEST BE ACCOMPLISHED. The leader does not generally participate beyond the point of initial instruction. In addition, it is the leader's responsibility to see that safety is a concern. Following are the locations of the 13 Stress/Challenge stations and some SUGGESTIONS for possible tasks to be used at each. THE LEADER may choose to consider additional creative uses of the course which would best serve the specific nature/needs of his/her group. The leader may refer to COWSTAILS ANL COBRAS by Rohnke (available in the LOMC media center) for additional Stress/Challenge activities.

TIRE POLE Location: behind the administration building

Task: to get the tires off and on the pole (in either order) using nothing but the people in the group.

ALL-ABOARD ROCK Location: grassy triangle in front of the Dining Hall

Task: Using the rock, get the entire group off of the ground for five seconds.

To get to the next section of the course, head from the All-Aboard Rock, past the dining hall, past the dairy barn, to a wide trail directly S.E. of the dining hall. Once on the wide trail, take the first trail on the right, up a steep hill.

TIRE SWINGS Location: at the top of the steep hill

Task: Get the entire group from one end to the other without touching the ground between the tires. The leader should identify starting and landing positions at a challenging distance from the first and last tires. If anyone touches the ground they must go back to the beginning.

UP AND OVER WALL Location: directly past the tire swings on the right.

Task: get the entire group over the wall on to the platform. Safety precaution: care should be taken so that children do not fall off the platform. Depending on the age of the group, the leader may allow, or not allow, help from the people on the ground.

SWINGING BALANCE BEAM Location: directly past the wall on the left.

Task: Get the entire group from one end of the beam to the other. If anyone falls they can be asked to go back to the beginning. We suggest that leaders (or other children if necessary) act as spotters on either side of the beam. Their roles is not to assist the beam walker but rather to guard against a fall.

STATIONARY BALANCE BEAM Location: take the path branching to the right.

Task: Get the entire group from one end of the beam to the other (from one tree to the other). The trees are boundaries - assistance may be given at each end but not in the Middle. Alternative Task: Get the entire group over the beam as if it were a wall or hurdle. Again, we suggest that leaders act as spotters.

FLEA HOP Location: Around the bend of the trail.

Task: Participants may hop from the post to post (lowest to highest). Individual participants may choose to do a trust fall from the last post. (To do a trust fall: the participant crosses his/her arms across their chest, closes his/her eyes, and falls into a cradle of arms made by the other participants. The cradle is formed by two lines of individuals facing each other and locking wrists. For more details, please consult an LOMC staff member) It is suggested that children below the sixth grade level not be permitted to do a trust fall. Leaders should plan to act as spotters.

MAZE Location: Between Stationary Beam and Flea Hop
Materials needed: Blindfolds for all the participants

Task: Participants are blindfolded and told to locate an object tied to the maze wires, or a person holding on to the wire. The object or person is located once everyone is blindfolded. Participants remain quiet through out. The participants follow the maze wires around until they find the object or person, then remain there, holding onto the object or person once found and until everyone else finds it.

ROPE BRIDGE Location: Follow the path to the right, around the meadow, to a path on the right leading back into the woods. (this path may be marked with surveyor's ribbon).

Task: Get the entire group across the cable. Walk on the bottom cable. Hold the middle cable. Leaders should determine whether this task is appropriate for his/her group based upon age/size of participants.

When the group is across the cable bridge, you may follow the path out into the meadow. Following the edge of the woods around to the right will lead your group to the Meadows Retreat Village.

TROLLEY Location: behind the Administration Building

Task: All the participants (12 maximun) are to move the trolley over a poisoned yogurt area (arbitrary distance, 10'-25') utilizing the two 4"X4"X12' lumber with ropes through it. The ropes are to hold onto in order to "walk" the trolley with everyone on it. Rules and penalties should be employed to make sure that no part of the participants' bodies, clothes, shoes, etc., touch the noxious yogurt.

TRACK WALK Location: Behind the Administration Building.

Task: Two participants, one on each piece of lumber, are to move from the near-end to the far-end by holding onto each other. They will need to place their weight against each other as they walk sideways down the lumber. Spotters are needed in case they fall.

The next three obstacles are to the east of Hill road about 50 meters north of the driveway into Barber House. Take the path that starts on the road.

The Meat Grinder can be seen from Hill Road.

MEAT GRINDER Location: About 50 meters east of Hill Road on path.

Task: All participants should get over the cable roll with the help of each other. The person going over should grab onto the spool ends while others turn it. When the person gets to the top, the spool should be stopped so the person can turn around for coming down. Spotters are needed on both the up and down sides.

NITRO CROSSING Location: Just past the Meat Grinder on path.

Task: Each participant must swing across the "trip poles" with a container of "nitro" water without spilling it. They are to use the rope for swinging. Participants are not allowed to touch the ground between the "trip poles" or to knock down those poles, otherwise they start again. The participants are not allowed to walk between the "trip poles" in order to get to the swing rope.

REBIRTH Location: Just past Nitro Crossing on path.

Task: The group tries to get each other through the suspended tire. The participant going through the tire may not touch the tire except where his/her body comes in contact with it in the center. That participant may not hold onto the tire. Once a person is through, she/he must stay on that side of the tire. The last person through receives no aid in getting up, but can be helped coming down. A feet first entry is not advised for females with loose blouses if the group is co-ed.

Please consult with the LOMC staff if you have questions or concerns about any part of the course you intend to use, No part of the course may be used without first checking with the LOMC staff and without approved supervision.

REFERENCES:

Available in the LOMC Resource Center for use at LOMC.

Rohnke, Karl: Cowstails & Cobras

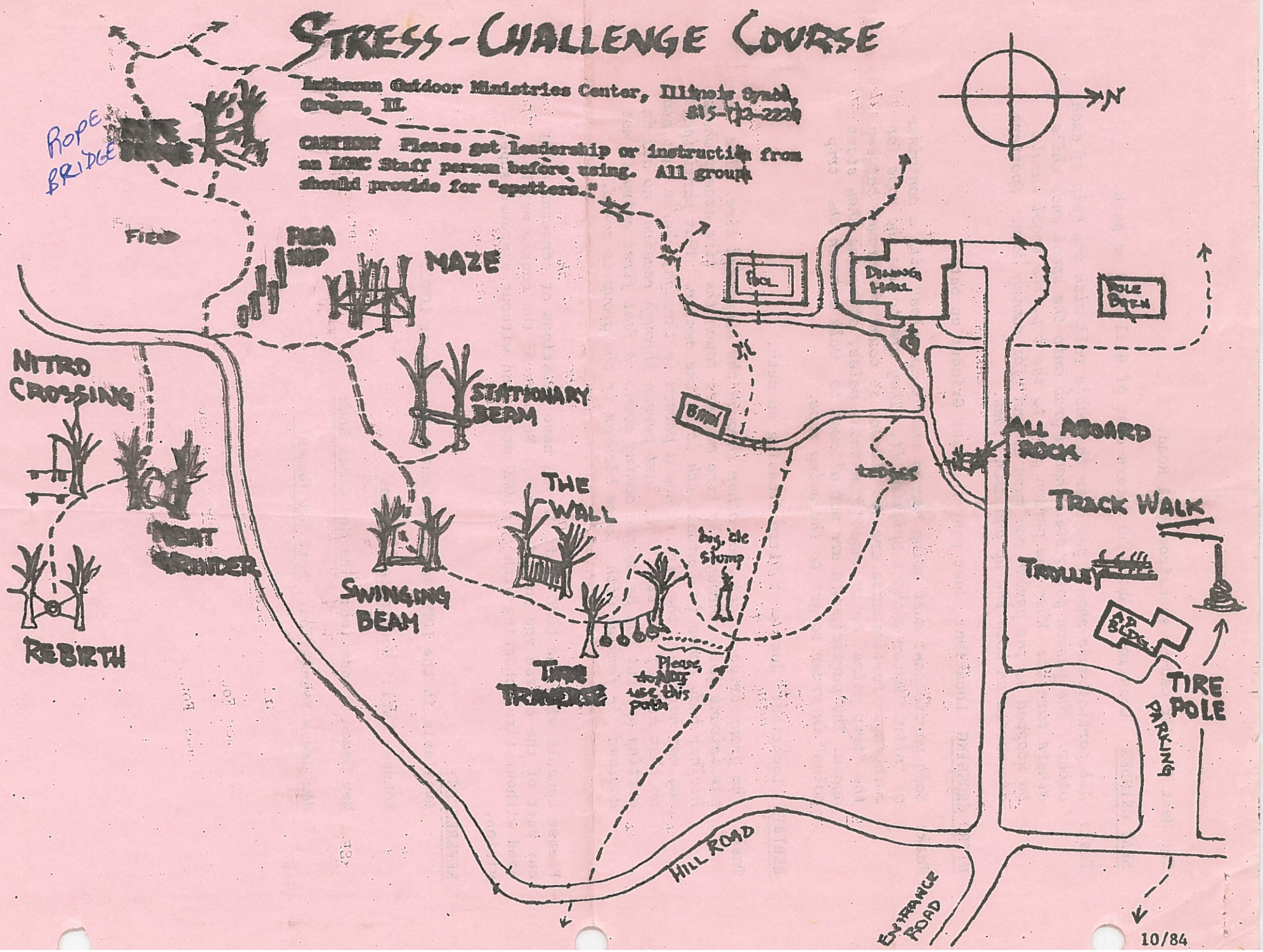
New Games Foundation: The New Games Book

New Games Foundation: More New GAmes!

STRESS-CHALLENGE COURSE

Lutheran Outdoor Ministries Center, Illinois Synod,
Oregon, IL [redacted]

CAUTION! Please get leadership or instruction from an LOMC Staff person before using. All groups should provide for "spotters."



ADDITIONS TO STRESS/CHALLENGE COURSE

LABYRINTH Location: Administration Building

Task: Group maneuvers board to roll a ball from start to finish avoiding the holes. Choose the type of ball based on the skills of the participants.

TRI POD WADDLE Location: Administration Building

Task: One person stand on the Tri Pod. Eight persons hold onto ropes (like a Maypole). Working together walk the Tri Pod.

Spotters can stand near the Tri Pod to catch the participant. This may be necessary with younger children, grade 6 to 8.

GENERAL LOMC INFORMATION

LUTHERAN OUTDOOR MINISTRIES CENTER
P. O. Box 239 - Oregon, IL 61061
Phone: 815/732-2220

ORIENTATION

I. MEALS

A. Times:

Breakfast	8:15 A.M.
Lunch/Dinner	12:15 P.M.
Supper	5:30 P.M.

B. Please be prompt for meals.

C. Several people should be sent to the dining hall to set tables for your group 10 minutes before each meal.

D. The remainder of your group is asked to wait outside the dining hall, on days when weather is favorable, or in the dining hall lounge, (on inclement days) until called to the dining area.

E. Instructions regarding dining hall procedures are attached. They can be reviewed at the first meal of the group.

II. EMERGENCIES/FACILITY PROBLEMS

A. In the event of emergencies or facility problems:

1. report to staff at meal time.
2. at night, contact one of our staff members stationed at the Administration Building (office) or the Property Manager's house.
3. When all else fails, other persons to contact would be:

Jack Swanson 734-4210
Glenn Oswald 732-6061

B. In the event of a medical emergency, contact one of the above. If none of the above are available call:

1. Local physician: Dr. Andres Mesrobian, M.D.
Warmolts Clinic
305 North 4th St., Oregon
Office Phone: 732-3151
Home Phone: 732-2469

2. Hospital: Katherine Shaw Bethea (K.S.B.)
Highway #2 South - 403 E. First St.
Dixon, IL
Phone: 1-288-5531

III. SPECIAL INFORMATION

A. Retreat Houses:

1. Do not lock doors - they will lock you out!
2. Fires and smoking are not permitted.
3. Do not play with fire extinguishers.
4. Graffiti, names, dates, love lives, etc... are not to be recorded on the buildings. If anything is observed, please report to the LOMC office.
5. PLEASE! PLEASE! Food must be handled carefully in retreat houses. Please keep area clear of crumbs and close up food containers. If possible store snack foods in your vehicles. Snacks are best eaten in the Conference Rooms or the Meeting Basements.

(over)

6. Do not adjust thermostats unless given permission by LOMC staff.
7. Keep outside doors shut and turn off lights when you leave a room. We need to conserve energy. Right?
8. Hair dryers - if used THEY MUST BE USED ONE AT A TIME IN THE BATHROOMS ONLY; otherwise the circuit breakers may cut out.
9. Dirty and wet clothes should be hung outside and not allowed to pile up in the retreat houses. If necessary, hang wet clothes over the ends of bunks.
10. Prop open the bathroom doors at night using the door stopper. (Helps relieve moisture)
11. Hot water is LIMITED. Follow directions in bathroom. The EXPOSED CIRCUIT BREAKER in the hallway is for the hot water and should be on.
12. Make sure the shower curtain is completely closed when taking a shower. This will eliminate water outside shower area.

B. Please treat the environment with respect:
   1. Please do not litter.
   2. Discourage the picking of living plants.
   3. Do not throw stones, sticks, or snowballs.
   4. Observe the animals. Do not handle.
   5. Leave only footprints - take only memories and pictures.
   6. Use designated paths.

C. Automobiles
   1. Driving around the LOMC grounds is discouraged. Please drive only for difficult and special situations. (Exceptions must be approved by the LOMC office).
   2. Please park in the designated areas by the Villages (not in the center of the Village), and in the parking lot of the Administration Building (not by the Dining Hall...it is a fire lane!)

D. Alcoholic beverages and drugs are not permitted.

E. Dining Hall
   1. Use only the exit in the lounge.
   2. Remove muddy, or snowy, shoes upon entering.
   3. Arrangements for coffee and tea between meals must be made with the LOMC office. There is an additional charge.
   4. At least one adult should sit at each table with youth. It helps with food distribution and deportment.
   5. The normal procedure is that the Dining Hall is cleaned and vacuumed after supper.

F. Shoes should be worn at all times.

G. All barns and camp equipment are not to be climbed upon.

H. There are ladders in several rooms that can be thrown out the windows to be used in the event of fire.

IV. CLEAN-UP PROCEDURES

A. Sweep all meeting and dorm areas used by your group.

B. Move beds and sweep all areas.

C. Clean out boxes under mattresses.

D. Pick up all trash in meeting and dorm areas and place in plastic bags.

E. Check all drawers and closets for the belongings of your group.

F. Pick up litter around the out-of-doors in areas of meeting and dorms.

LUTHERAN OUTDOOR MINISTRIES CENTER

MEMO TO: All Guests
FROM: Glenn Oswald
DATE: _____
RE: Procedures when weather is cold and/or wet.

Winter weather (temperature, precipitation, and wind) can do unusual things to your body and vehicle. Here are a few pointers for care.

Vehicles The vehicle(s) that got you here is expected to take you home. If cold weather sets in cars and buses need to be treated a little differently and that is your responsibility. Sometimes a vehicle's weaknesses are severely exposed. May we make a few suggestions:

1. Park your vehicle in the place with least wind. Point the car south when it is parked. Best location on site is the parking lot at the Administration Building.
2. You can start your car frequently or remove your battery and place it on a wooden board in the Administration Building basement.
3. Before you settle down, top off your gas tank and add a fuel additive like "Heat".

We plan to keep the roads open and the hill road passable. However, you will need to drive cautiously. When there is ice, it is best not to "gun" the accelerator - this just makes the situation worse.

If you are in trouble, there is some help from the service stations in town (but in bad weather, everyone wants help). LOMC has a truck and can jump cars, push, pull, etc.

People It is best to dress warmly with several layers of clothes so that the outer layers can be removed as you warm-up with exercise. Even as the weather warms, damp clothes (from snow melting on clothes) is also a health problem. Long underwear is usually a good idea. The outer layers of clothes work best with wool, wool-blend, nylon, nylon-blend or polypropylene fabrics. Of course, don't forget caps (with ear coverings) and gloves.

For the safety of your group, please check with the LOMC Staff before walking on the pond. Never walk on the creek, even if it seems frozen - it isn't!

(over)

You should be alert to any frostbite and hypothermia (the body can't produce enough heat) symptoms of the members of your group. LOMC Staff can provide some first aid help if you need it.

Please plan ahead with contingencies. Let us know if we can be of help.

Peace

GO/dh

11/84

STOVE INSTRUCTIONS AND WARNINGS

STARTING A FIRE

1. Turn the thermostat (handle on right side of stove) clock-wise to the full-open position.
2. Lay a small amount of dry crushed paper in the fire box. On top of the paper lay enough kindling to insure continued combustion.
3. Light the fire and close the feed door.
4. As the combustion gains in intensity, add larger pieces of wood.
5. Set the thermostat to the desired setting.
6. Close the thermostat on the stove before leaving at night.

WARNINGS:!!!!!!!!!!!!!!!!

Do not burn anything with the doors open.
Do not slam stove doors or otherwise impact the glass.
Keep the fire in the stove back away from the glass, especially during start-up.
Never build a "roaring" fire in the stove. This wastes fuel and can cause breakage of the glass through thermal shock or mechanical stress resulting from warping of the glass mounting.

DO NOT OVERFILL HEATER, THE STOVE SHOULD NOT BE LOADED IN A MANNER THAT WILL ALLOW WOOD TO ROLL FORWARD ONTO THE THRESHOLD OR PLATFORM AREA INSIDE THE DOOR.

CAUTION: HOT SURFACES

*****Notice should be taken that areas of this stove are hot while in operation. Do Not touch. Keep children, clothing, furniture, and other combustibles away. Contact may cause skin burns.

For more circulation you may turn on building fan. The timer for the fan is found next to the light switches by the door. Turn the handle to the number of minutes that you want it to run.

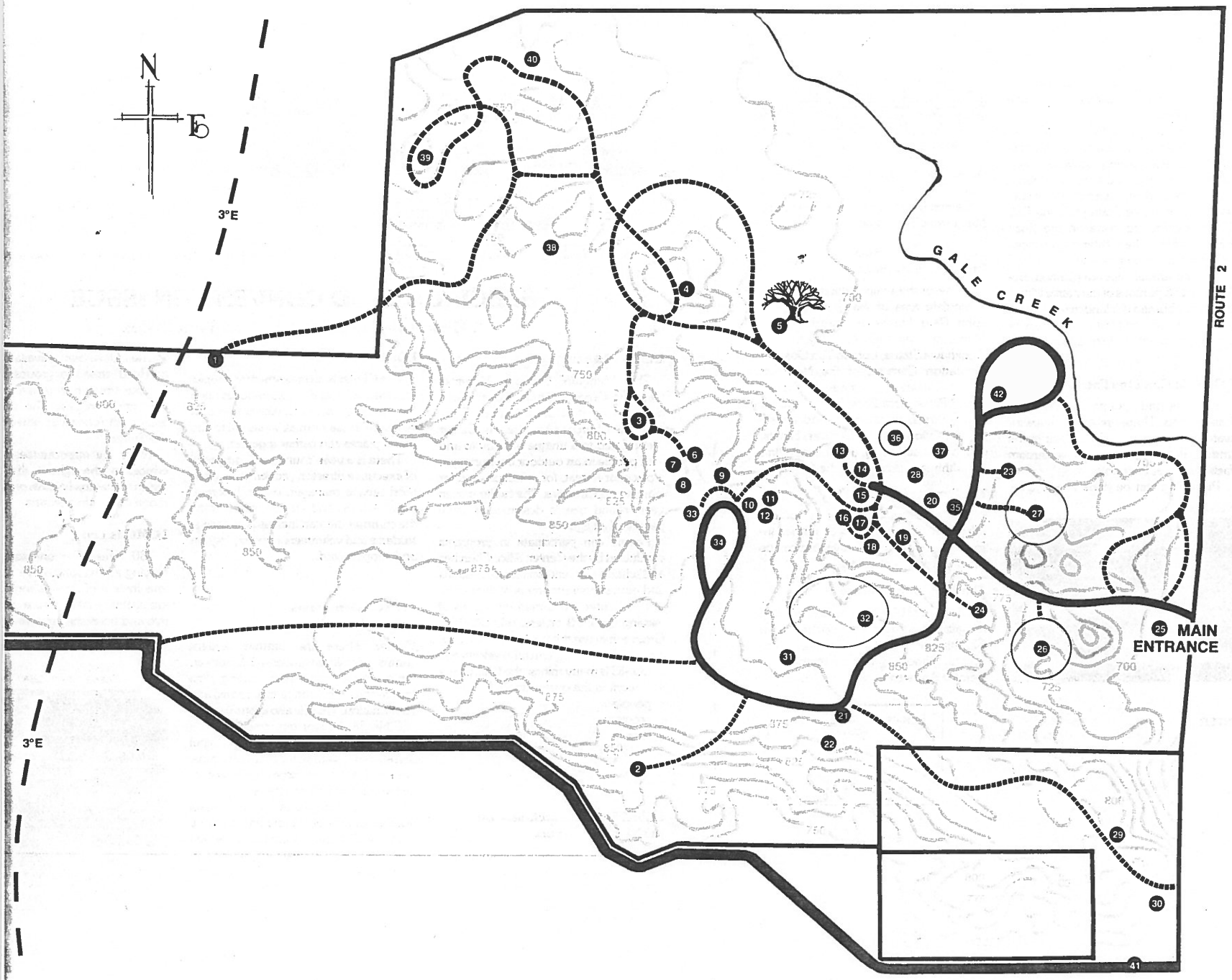
THE SIGNATURE GAME

1. Sit on Santa's lap and tell him 3 things you want for Christmas.
2. Pretend you just won the Miss America pageant and take your winning stroll.
3. Cry like a Pterodactyl 3 times.
4. Sing the Brady Bunch song at the top of your lungs.
5. Walk on your knees for ten feet.
6. Repeat "Toyboat" 10 times as fast as you can.
7. Give 3 reasons why you prefer potatoes or stove top stuffing.
8. Walk in a circle 3 times, waddling like a duck and quacking.
9. Name your 3 favorite TV shows.
10. Sing the first verse to your favorite song.
11. Imitate your favorite athlete.
12. Name 3 things you like to do after school.
13. Do any combination of somersaults and cartwheels totalling 5.
14. Imitate your favorite celebrity.
15. Do the "moonwalk" for 5 feet.
16. Name your favorite entertainers.
17. Tell if you really like the Cubs or if you just hopped on the bandwagon because they are doing so well.
18. Do jumping jacks for 15 seconds.
19. Stand on a chair and say the Pledge of Allegiance.
20. Hop up and down on one foot and sing "Mary Had A Little Lamb."
21. Pretend you just got hit by a semi-truck.
22. Name your 3 favorite meals.
23. Jump up and kick your heels like they do on the Toyota commercials.
24. Name the one thing in this world you will not eat.
25. Name 3 things you look for in a friend.

Scavenger Hunt 1989

1. How many gallons of water in the pool?
2. What Bible verse is on the sign at the entrance road?
3. Find a 4-leaf clover.
4. Find a pineapple weed.
5. What was Rich Alms' car called?

7. Who is the Property Manager?
8. What does P.F.D. stand for?
9. How many canoes does L.O.H.C. own?
10. How many tires on the <u>whole</u> atress challenge course?
11. What is a yurt?
12. How many Hogans are there?
13. How many windows on the North side of the dining hall?
14. What is the staff elevator?
15. What is the best known tree at camp?
16. Find 3 live ants.
17. What is happening to the environment at Stoney Point?
18. Find 3 pine cones.
19. How many poles in the pole barn?
20. How many steps on the meadows trail?
21. How many official campfire sites are there?
22. Find 1 red oak tree leaf.
23. Find 1 blue bandana.
24. Find 1 dandelion gone to seed.
25. How many staff members are from another country—who and what country are they from?
26. Find 1 clump of belly button lint—4 extra point if it is still in belly button
27. What types of animals are on St. Francis' statue?



LUTHERAN OUTDOOR MINISTRIES CENTER

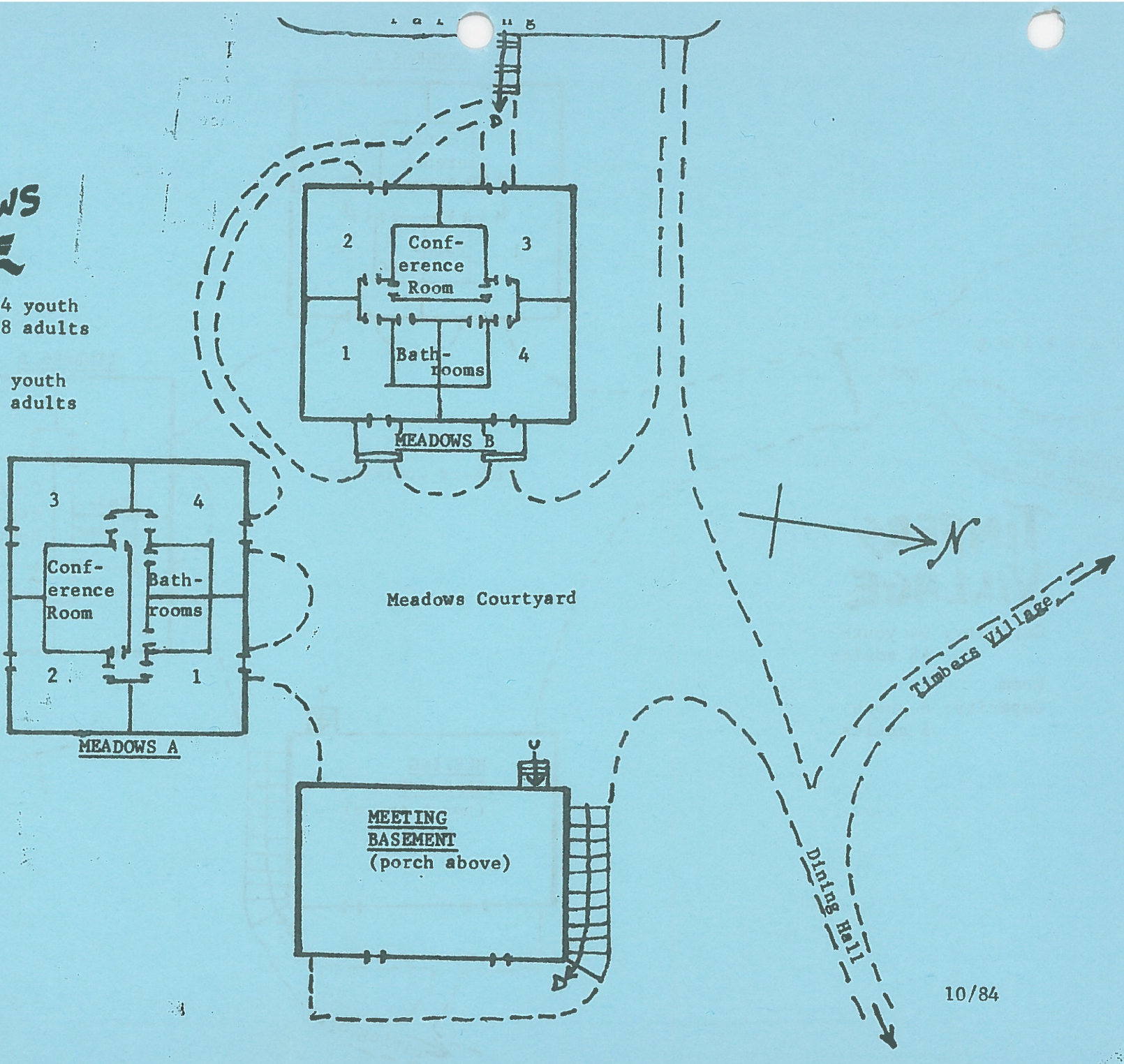
Oregon, Illinois 61061

1. Outcamp
2. J B—campfire site
3. Levi's cave
4. Stony Point—campfire site
5. Freedom Tree
6. Timbers meeting basement
7. Timbers B Retreat House
8. Timbers A Retreat House
9. Timbers Village parking
10. Meadows B Retreat House
11. Meadows meeting basement
12. Meadows A Retreat House
13. New Revival campfire site
14. Pole Barn
15. Dining Hall and Lounge
16. Hillside Retreat House
17. Pool and bathhouse
18. Dairy Barn
19. Festival—campfire site
20. Administration Building
21. Barber House parking
22. Barber House
23. Old Revival Campfire Site
24. Muhlenberg Campfire Site
25. Property Manager's Residence
26. Proposed hogan area
27. Hogan/tent area
28. Picnic area
29. Backbone Campfire Site
30. Devil's Backbone Outcropping
31. Play Field
32. Stress/Challenge Course
33. Timbers Campfire Site
34. Play Field
35. Administration Parking
36. Corral
37. Play Field
38. Cricket Frog Pond
39. Turtle Hill
40. Railroad Ridge
41. Devil's Backbone Road
42. Tent/Trailer Area

MEADOWS VILLAGE

Capacity: 64 youth
48 adults

Room
Capacity: 8 youth
6 adults



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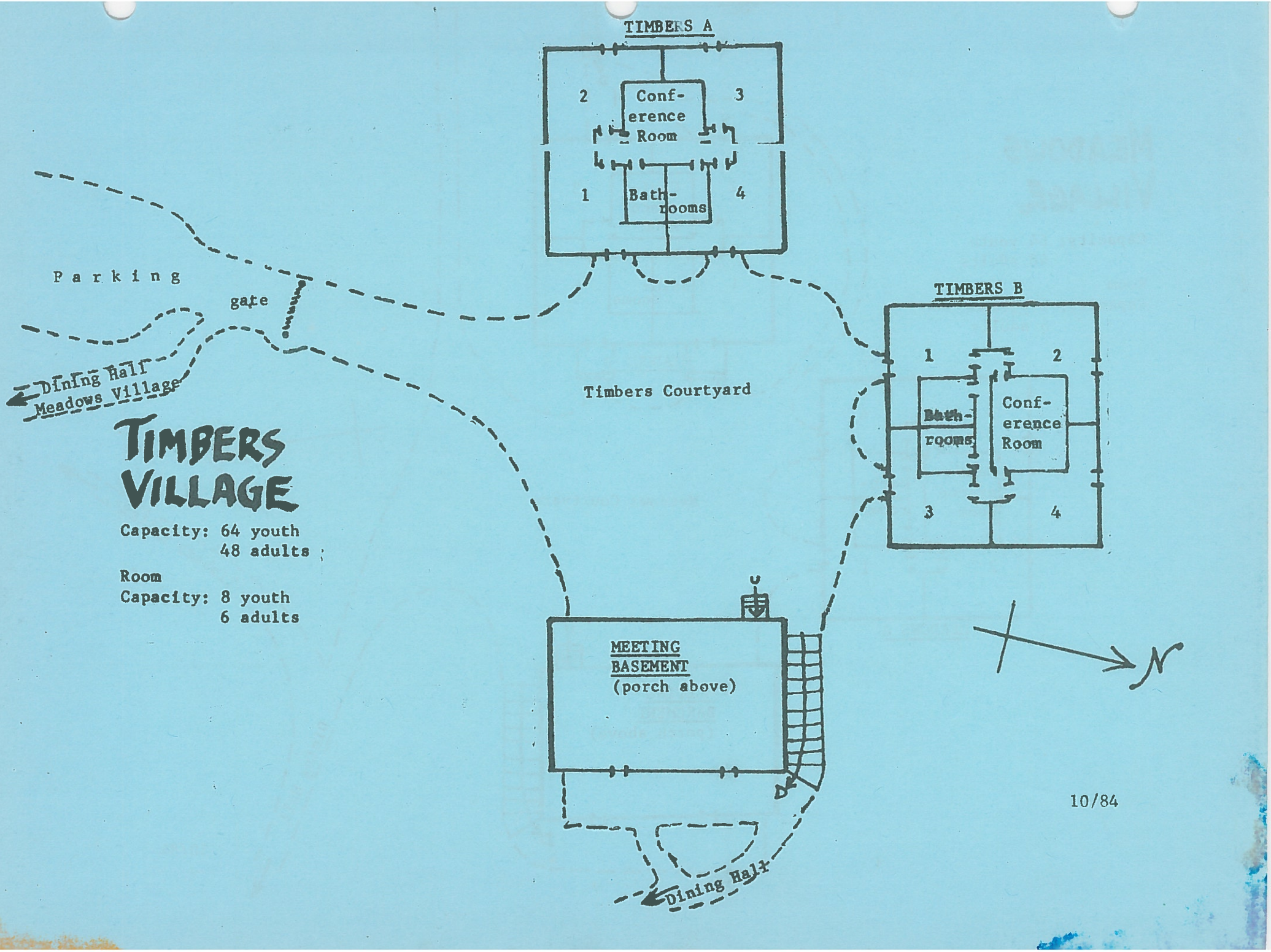
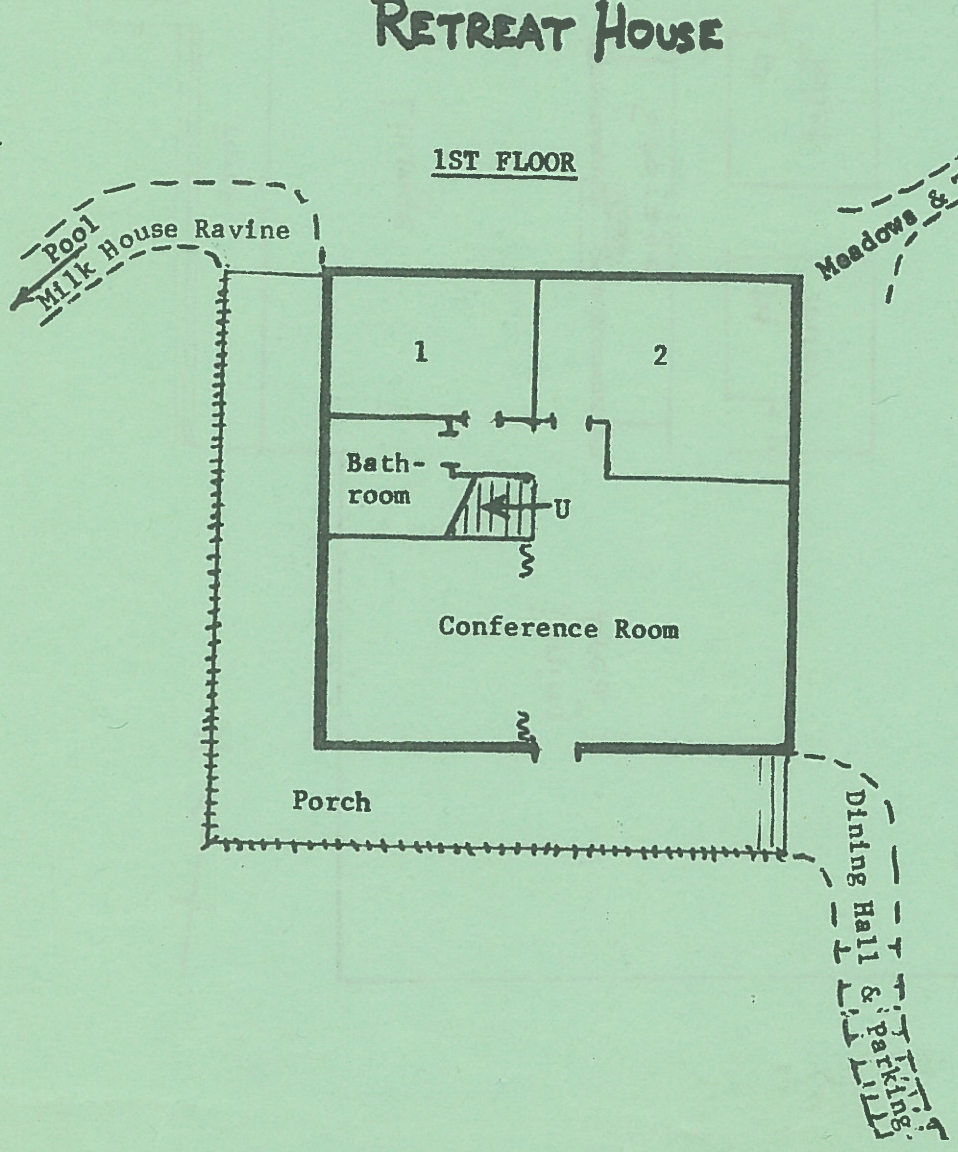

TIMBERS A
2
Conf-
erence
Room
3
1
Bath-
rooms
4
Parking
gate
Dining Hall
Meadows Village
Timbers Courtyard
TIMBERS B
1
2
Bath-
rooms
Conf-
erence
Room
3
4
TIMBERS
VILLAGE
Capacity: 64 youth
48 adults
Room
Capacity: 8 youth
6 adults
MEETING
BASEMENT
(porch above)
N
Dining Hall
10/84

HILLSIDE
RETREAT HOUSE

Capacity: 34 youth
26 adults

Room Capacity:
#1 - 4 youth, 4 adults
#2 - 8 youth, 6 adults
#3 - 8 youth, 6 adults
#4 - 8 youth, 6 adults
#5 - 6 youth, 4 adults

1ST FLOOR



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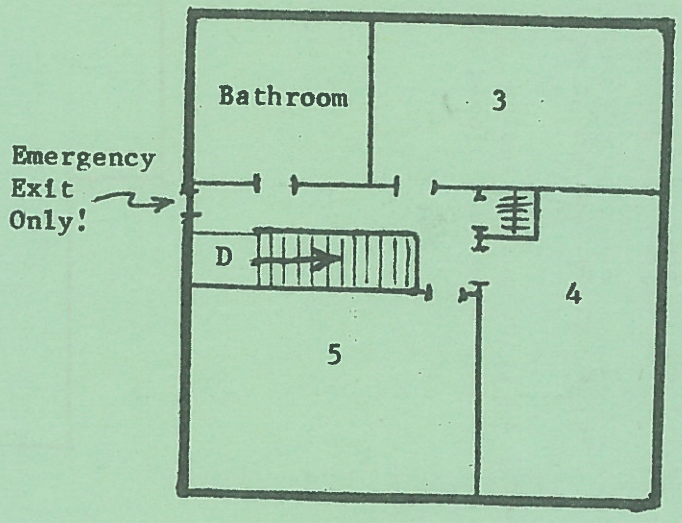
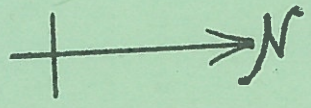
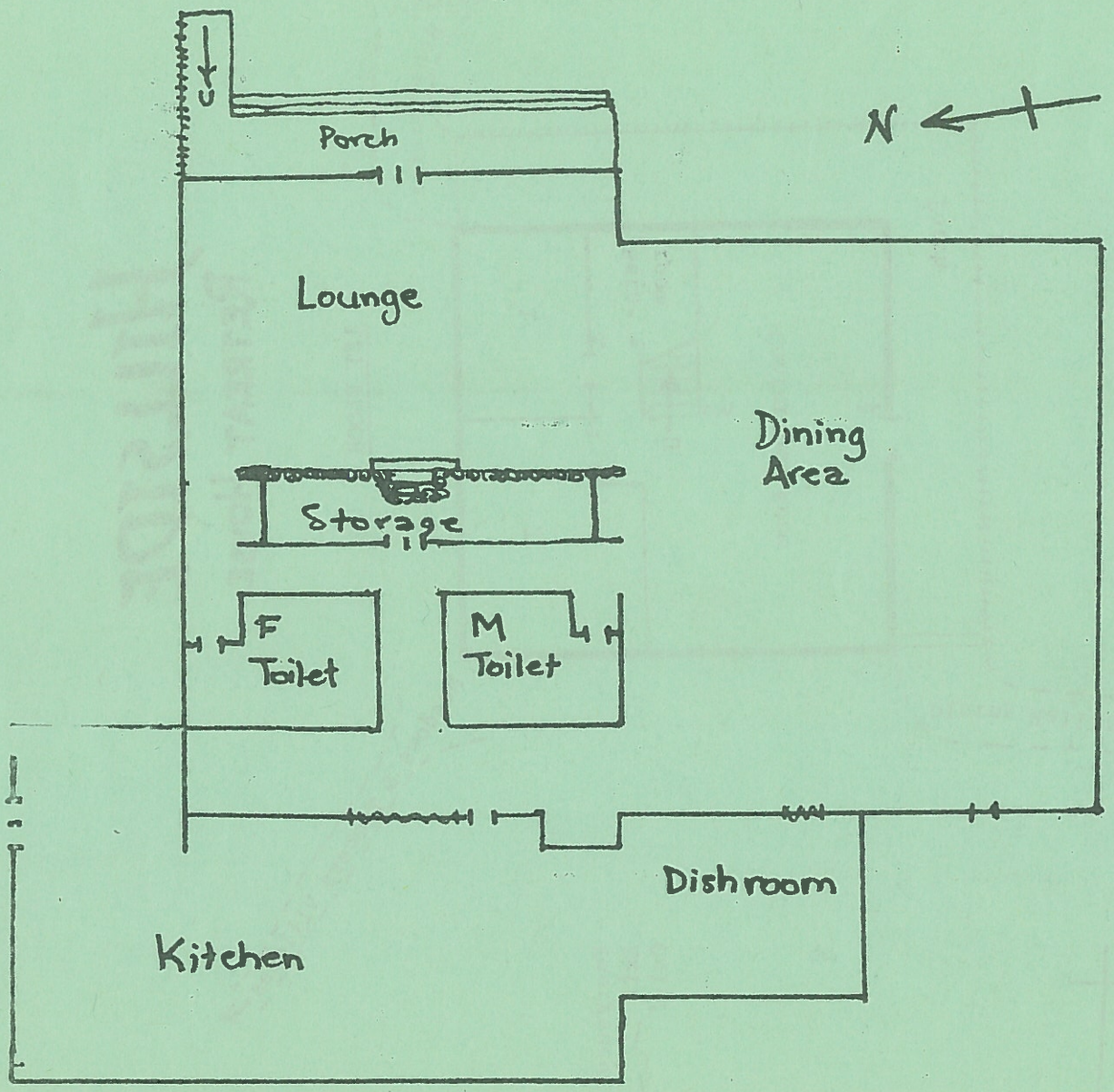




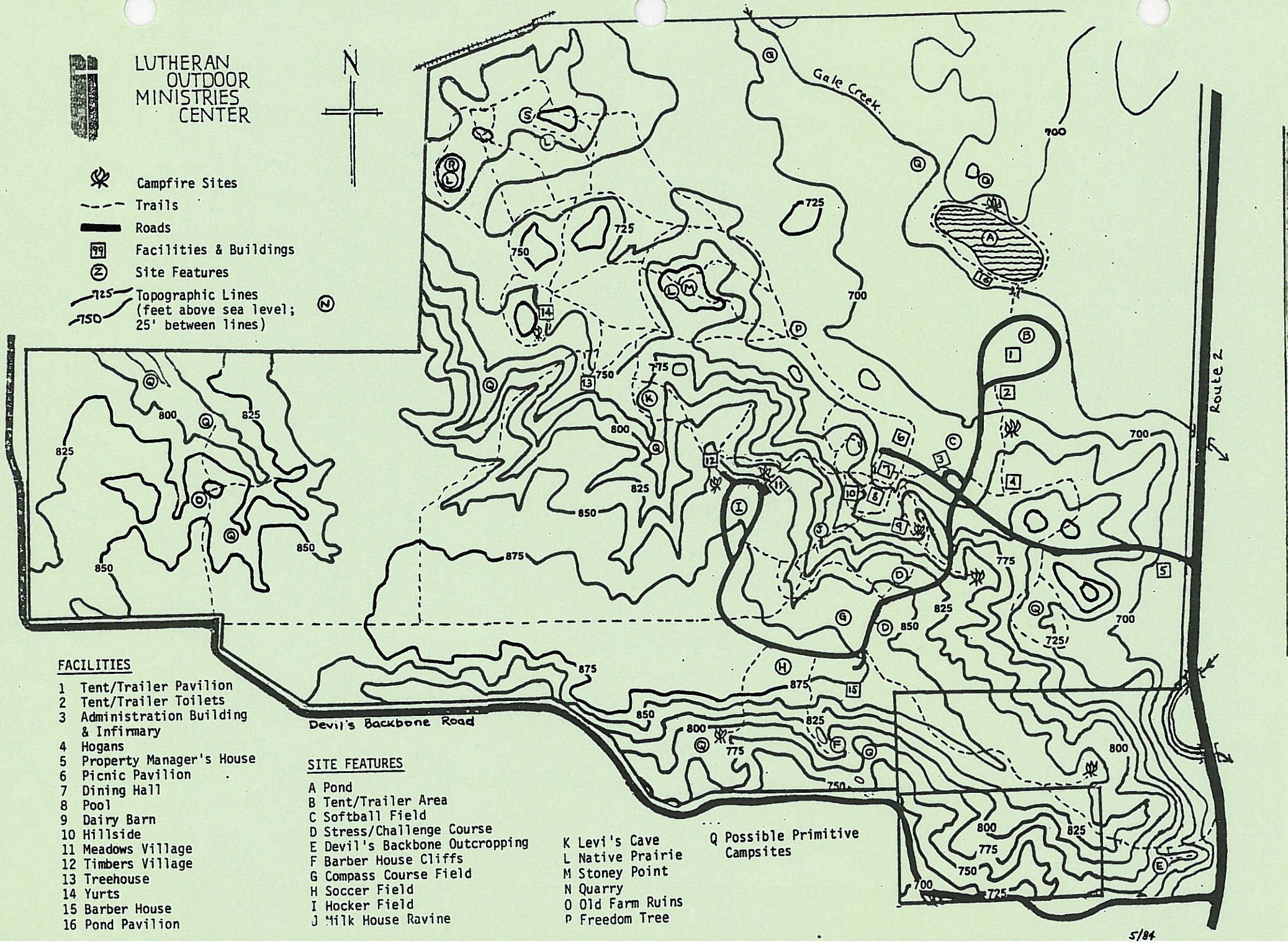


DINING HALL

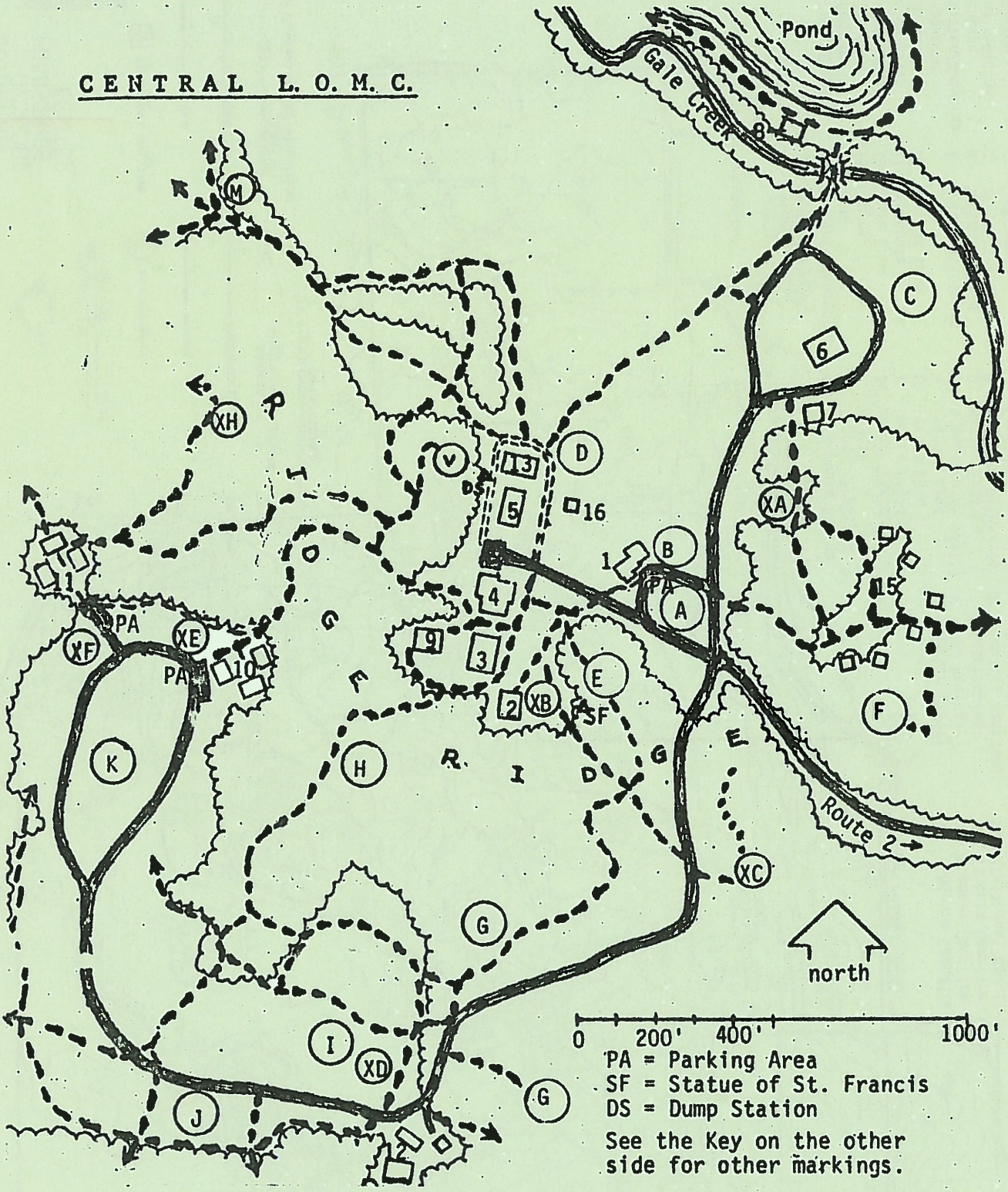
Capacities: Lounge - 60 people seated in chairs
100 people seated on floor (carpet)

Dining
Area - 180 people seated at tables

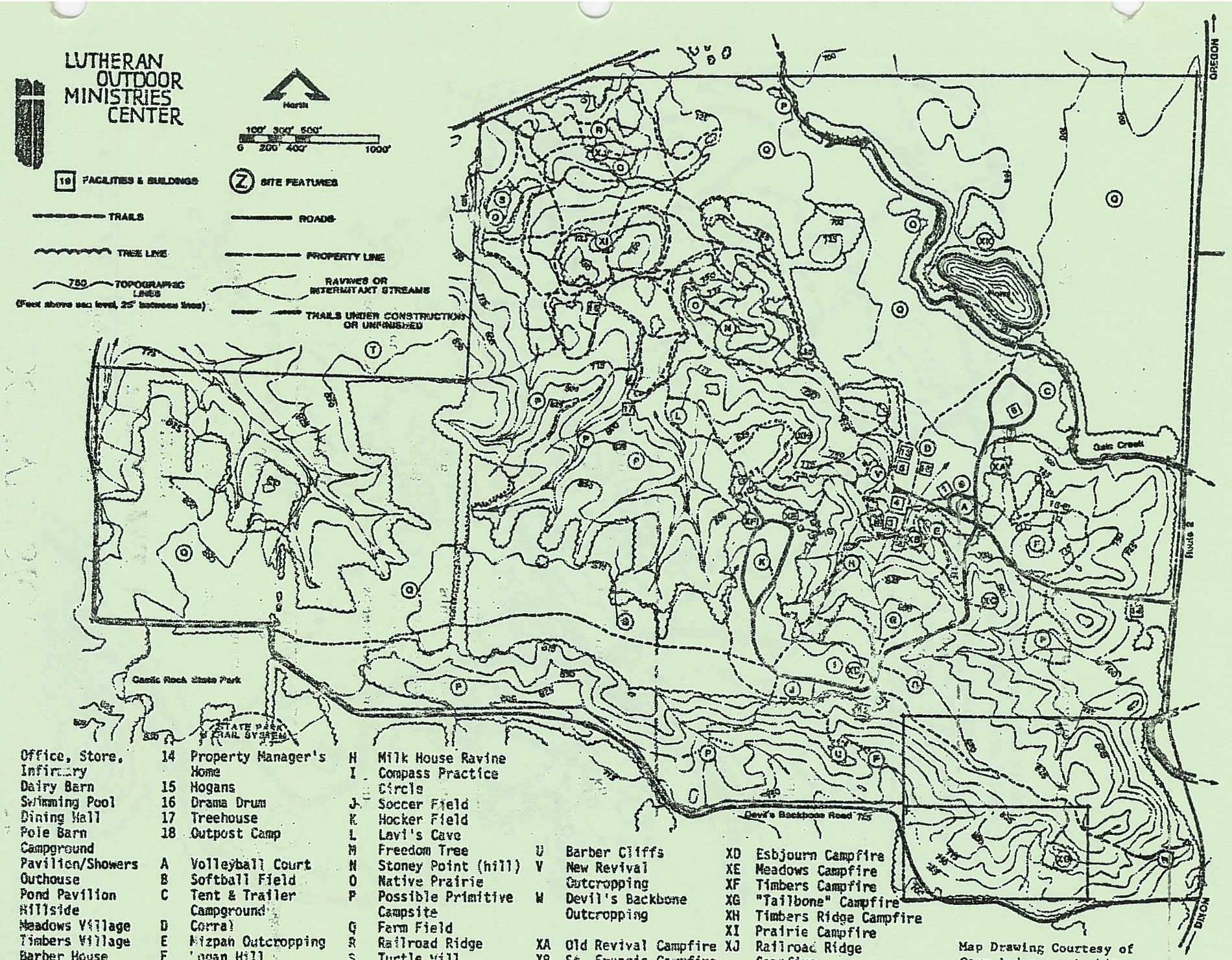
Most of the Lounge and Dining Area are carpetted. There is a fireplace in the Lounge. Most all of the Lounge and Dining Area outside walls have large windows.


LUTHERAN OUTDOOR MINISTRIES CENTER
N
Campfire Sites
Trails
Roads
Facilities & Buildings
Site Features
Topographic Lines (feet above sea level; 25' between lines)
Gale Creek
Route 2
Devil's Backbone Road
FACILITIES
1 Tent/Trailer Pavilion
2 Tent/Trailer Toilets
3 Administration Building & Infirmary
4 Hogans
5 Property Manager's House
6 Picnic Pavilion
7 Dining Hall
8 Pool
9 Dairy Barn
10 Hillside
11 Meadows Village
12 Timbers Village
13 Treehouse
14 Yurts
15 Barber House
16 Pond Pavilion
SITE FEATURES
A Pond
B Tent/Trailer Area
C Softball Field
D Stress/Challenge Course
E Devil's Backbone Outcropping
F Barber House Cliffs
G Compass Course Field
H Soccer Field
I Hocker Field
J Milk House Ravine
K Levi's Cave
L Native Prairie
M Stoney Point
N Quarry
O Old Farm Ruins
P Freedom Tree
Q Possible Primitive Campsites
5/84

CENTRAL L. O. M. C.



LUTHERAN OUTDOOR MINISTRIES CENTER



1	Office, Store, Infirmary	14	Property Manager's Home	H	Milk House Ravine				
2	Dairy Barn	15	Hogans	I	Compass Practice Circle				
3	Swimming Pool	16	Drama Drum	J	Soccer Field				
4	Dining Hall	17	Treehouse	K	Hocker Field				
5	Pole Barn	18	Outpost Camp	L	Levi's Cave				
6	Campground Pavilion/Showers			M	Freedom Tree	U	Barber Cliffs	XD	Esbjourn Campfire
7	Outhouse	A	Volleyball Court	N	Stoney Point (hill)	V	New Revival Outcropping	XE	Meadows Campfire
8	Pond Pavilion	B	Softball Field	O	Native Prairie			XF	Timbers Campfire
9	Hillside	C	Tent & Trailer Campground	P	Possible Primitive Campsite	W	Devil's Backbone Outcropping	XG	"Tailbone" Campfire
10	Meadows Village	D	Corral	Q	Farm Field			XH	Timbers Ridge Campfire
11	Timbers Village	E	Mizpah Outcropping	R	Railroad Ridge	XA	Old Revival Campfire	XI	Prairie Campfire
12	Barber House	F	Logan Hill	S	Turtle Hill	XB	St. Francis Campfire	XJ	Railroad Ridge Campfire
13	Maintenance Shed	G	Stree/Challenge	T	Private Quarry	XC	Muhlenberg Campfire	XK	Pond Campfire

Map Drawing Courtesy of Gary Anderson, Architect, Rockford, Illinois

METRIC CONVERSION CHART*

Symbol	When You Know	Multiply by	To Find	Symbol
		LENGTH		
in	inches	2.5	centimeters	cm
ft	feet	30	centimeters	cm
yd	yards	0.9	meters	m
mi	miles	1.6	kilometers	km
		AREA		
in^2	square inches	6.5	square centimeters	cm^2
ft^2	square feet	0.09	square meters	m^2
yd^2	square yards	0.08	square meters	m^2
mi^2	square miles	2.6	square kilometers	km^2
	acres	0.4	hectares	ha
		MASS (weight)		
oz	ounces	28	grams	g
lb	pounds	0.45	kilograms	kg
	short tons (2,000 pounds)	0.9	tonnes	t
		VOLUME		
tsp	teaspoons	5	milliliters	ml
Tbsp	tablespoons	15	milliliters	ml
fl oz	fluid ounces	30	milliliters	ml
c	cups	0.24	liters	l
pt	pints	0.47	liters	l
qt	quarts	0.95	liters	l
gal	gallons	3.8	liters	l
ft^3	cubic feet	0.03	cubic meters	m^3
yd^3	cubic yards	0.76	cubic meters	m^3
		TEMPERATURE (exact)		
°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C

METRIC CONVERSION CHART*

LENGTH

symbol	unit	number of meters
km	kilometer	1,000
hm	hectometer	100
dkm	decameter	10
m	meter	1
dm	decimeter	0.1
cm	centimeter	0.01
mm	millimeter	0.001

AREA

symbol	unit	number of square meters
km^2	square kilometer	1,000,000
ha	hectare	10,000
a	are	100
ca	centare	1
cm^2	square centimeter	0.0001

MASS (weight)

symbol	unit	number of grams
t	metric ton or tonne	1,000,000
kg	kilogram	1,000
hg	hectogram	100
dkg	decagram	10
g	gram	1
dg	decigram	0.1
cg	centigram	0.01
mg	milligram	0.001

VOLUME

symbol	unit	number of cubic meters
cm^3 (or cc)	cubic centimeters	0.000001

CAPACITY

symbol	unit	number of liters
kl	kiloliters	1,000
hl	hectoliter	100
dkl	decaliter	10
l	liter	1
dl	deciliter	0.1
cl	centiliter	0.01
ml	milliliter	0.001

TEMPERATURE
Celsius scale

°C	degree Celsius
0°C	freezing point of water
100°C	boiling point of water

*This chart is reprinted with permission from the **Project Learning Tree Supplementary Activity Guide for Grades K—6** (Washington, D.C.: American Forest Institute, 1977).*