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ABSTRACT

The relationship that exists among living and nonliving things on earth is very delicate and important. This unit is designed to provide information on nature's balance which is of interest to and understood by special education students. The unit activities are intended for use by level 2 and level 3 educable mentally retarded students. There are four topics: (1) Necessities of Life, (2) Food Getting Among Animals, (3) Field Trip--Wildlife Homes and Food Supply, and (4) Man and Wildlife. For each topic, there are behavioral objectives, student activities, and teacher suggestions. The objectives taught can be evaluated by the pretest and posttest developed for the unit. The appendix provides teaching aids designed to help the teacher meet the needs of individual students. (JP)

ENVIRONMENTAL EDUCATION PROJECT
ESEA TITLE III, SECTION 306

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A unit developed by the Environmental Education Project Staff, October, 1971, revised November, 1972, and August, 1973, for Level II and III Educable Mentally Retarded Special Education Classes.

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BALANCE OF NATURE

The work presented or reported herein was performed pursuant to a grant from the United States Office of Education. However, the opinions and material expressed herein do not necessarily reflect the position or policy of the U. S. Office of Education, and no official endorsement by the U. S. Office of Education should be inferred.

Foreword

The relationship that exists among living and non-living things on earth is very delicate and important. By disturbing one single aspect of nature, a whole chain of disturbances can occur. Everything is dependent to some extent on something else. Everything in nature, no matter how large or small, has a role to play in the "Balance of Nature."

This unit is designed to provide information on nature's balance which is of interest to and understandable by special education students. The unit activities are designed for level II and III educable mentally retarded students. There are four topics: 1) Necessities of Life; 2) Food Getting Among Animals; 3) Field Trip - Wildlife Homes and Food Supply; and 4) Man and Wildlife.

For each topic, there are behavioral objectives, student activities, and teacher suggestions. Teachers may select and teach those objectives in the unit that fit their class. The numbers in parenthesis by each activity indicate the objective the activity helps develop. A variety of activities are provided for each objective. It is not expected that every activity will need to be used to achieve a specific objective. The variety of activities are presented so teachers may select the activities that are appropriate for individual students and their specific classes. Teachers should feel free to modify or substitute activities to accomplish the objectives of the unit. Some objectives are more difficult than others. The objectives taught can be evaluated by the pretest and posttest developed for the unit.

The appendix provides teaching aids designed to help the teacher meet the needs of individual students.

Thad Whiteaker

Thad Whiteaker
Program Specialist - Special Education

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My sincere gratitude is extended to the program specialists for their tireless efforts in developing this unit. Curriculum development and revision has extended the working days for these staff members. My personal thanks are given to Glenn Clarkson, Bob King, and Thad Whiteaker for an outstanding job.

The enclosed curriculum is the result of input from the project's paraprofessionals and volunteers, special education teachers, Community Council members, parents, students, and interested lay citizens.

With the deepest appreciation, I acknowledge the work of the secretarial team. The constant revisions, pressures, deadlines, and demands for quality work were handled in a most outstanding manner by Dorothy Booher, Sandy Holmes, Rita Dreiling and Peggy Kerter.

Donald French
Project Coordinator

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Goals and Objectives

Goals:

1) To develop an appreciation for living things in our environment.

2) To develop an understanding of the basic needs of all living things in our environment.

3) To develop an understanding of how each living thing influences the balance of nature.

Behavioral Objectives:

1) Given four choices, participating students will select "water for drinking" as the most important use people have for water.

2) Given four choices, participating students will select "oxygen" as important to nearly all forms of life.

3) Given four choices, participating students will select "energy and growth" as the main reason that people and animals need food.

4) Given four choices, participating students will select "plants" as a common food item for both people and animals.

5) Given four choices, participating students will select "sunlight, water, and air" as things a plant must have in order to grow.

6) Given four choices, participating students will select "grass $\longrightarrow$ rabbit $\longrightarrow$ hawk" as the correct food chain.

7) Given four choices, participating students will select "fox" as an example of a predator.

8) Given four choices, participating students will select "rabbit" as an example of an animal of prey.

9) Given four choices, participating students will select "plant" as an example of a producer.

10) Given four choices, participating students will select a "hawk" as an example of a consumer.

11) Given four choices, participating students will select "because of shelter and food" as the reason that a squirrel lives in a woodland area.

12) Given four choices, participating students will select "pond" as a home for bugs, frogs, turtles, and fish.

13) Given four choices, participating students will select a "grassland" as the place where a hawk would get most of its food.

14) Given four choices, participating students will select a "pond" as the area that supplies wildlife food, drink, and homes.

15) Given four choices, participating students will select "grass → mouse → hawk" as an example of a grassland food chain.

16) Given four choices, participating students will select "woodlands → squirrel → man" as an example of a woodlands food chain.

17) Given four choices, participating students will select "bugs → frog → fish" as an example of a food chain for a pond area.

18) Given four statements concerning wildlife, participating students will select "most wildlife is important" as the statement that is most accurate.

19) Given four choices, participating students will select "floods, fires, cold, and people" as the group that destroys wildlife.

20) Given four choices, participating students will select "hawks, squirrels, fish, deer, and owls" as the group of animals that are protected by law in Kansas.

21) Given four choices, participating students will select "people" as the greatest threat to wildlife.

Objective Summary Sheet

Objective Number	Concept Within the Objective	Test Question Number	Class Pretest Results	Class Posttest Results
1	Water for drinking is a necessity for life.	1	_____	_____
2	Oxygen is a necessity for nearly all forms of life.	2	_____	_____
3	All forms of animal life need food for energy and growth.	3	_____	_____
4	Plants can be a common food item for all forms of animal life.	4	_____	_____
5	Plants need light, water, and air for growth.	5	_____	_____
6	Correctly identify a food chain.	6	_____	_____
7	Identify a predator.	7	_____	_____
8	Identify an animal of prey.	8	_____	_____
9	Identify a producer.	9	_____	_____
10	Identify a consumer.	10	_____	_____
11	Squirrels belong in a woodland habitat.	11	_____	_____
12	A pond is a habitat for several forms of wildlife.	12	_____	_____
13	A grassland area furnishes a hawk with much of its food supply.	13	_____	_____
14	A pond provides water, food, and protection for many forms of wildlife.	14	_____	_____
15	Identify a food chain common to a grassland area.	15	_____	_____
16	Identify a food chain common to a woods area.	16	_____	_____

Objective Summary Sheet (Continued)

Objective Number	Concept Within the Objective	Test Question Number	Class Pretest Results	Class Posttest Results
17	Identify a pond food chain.	17	_____	_____
18	All forms of wildlife are dependent upon each other.	18	_____	_____
19	Identify things that destroy wildlife.	19	_____	_____
20	Laws are needed to protect certain kinds of wildlife.	20	_____	_____
21	Identify man as the most serious threat to wildlife.	21	_____	_____

Unit Time Line

DAY	
	Before the trip:
X	Administer student test (Appendix X). This will be the pretest.
	Schedule all films and filmstrips for the dates that you will need them.
	Begin study of the unit.
	Begin seed-growing experiment.
	Determine a field trip date.
14	Submit field trip request to building principal. Be sure to check to see that all requirements for notification of parents have been fulfilled.
	Check Activity 27. If you want to use a Game Protector as a resource person, make the arrangements now.
7	Meet with those helping with the trip to go over field trip details.
	Begin collecting newspaper and magazine materials for Activity 26.
1	Contact program specialist to affirm readiness for the trip on the following day.
	Prepare students for the trip.
0	Field trip.
	After the trip:
1	Begin study of Topic IV.
	Complete the study of the unit.
	Administer test (Appendix X). This will be the posttest.
	Fill out the Teacher's Unit Evaluation. Submit it to the program specialist.

Materials Sheet

This information gives a preview of the materials that will be needed to effectively teach the unit.

Activity	Unit Activity Number	Unit Page Number	Materials
An imaginary camping trip.	3	9	Hiking pack.
A filmstrip lesson on air.	6	11	Filmstrip series: Primary Science In Our Lives. The poem "A Ride With The Wind" (see Appendix III).
Basic needs poster - bulletin board.	7	11	Poster Board (see Appendix IX).
Basic needs discussion.	8	11	Magazine pictures, other visual materials.
Plant-growing experiment.	9	12	Pans or pots, soil, seeds.
View film and discuss.	10	13	Film: Green Plants and Sunlight.
Food discussion.	11	13	Pictures of a variety of foodstuff; actual foodstuff may be used.
Energy demonstration.	12	14	Paper clip, peanut, match.
View film and discuss.	13	14	Film: Plants Make Food.
Food puzzle.	14	15	Duplication of the food puzzle (see Appendix IV).
Food web - food chain.	15	17	Poster board, construction paper, yarn, duplicates of food chain (see Appendix V).
View film and discuss.	16	17	Film: Food Getting Among Animals.

Materials Sheet (Continued)

Activity	Unit Activity Number	Unit Page Number	Materials
View film and discuss.	17	17	Film: How Nature Protects Animals.
View film and discuss.	18	18	Film: The Prairie.
Food gathering characteristics.	19	19	Duplicates of food gathering characteristics of birds (see Appendix VI).
Nature words.	20	18	Duplicates of nature words (see Appendix VII).
View film and discuss.	24	23	Film: Wood Duck's World.
Story: The Big Flood.	25	24	Duplicates of The Big Flood (see Appendix VIII).
Reports on floods, fires, and severe winters.	26	24	Newspaper or magazine articles relating to floods, fires, or very severe winters.
A study of laws relating to wildlife.	27	25	Pamphlets and other written materials relating to hunting, fishing, and game management.

TOPIC I: Necessities of Life

Behavioral Objectives:

1. Given four choices, participating students will select "water for drinking" as the most important use people have for water.
2. Given four choices, participating students will select "oxygen" as important to nearly all forms of life.
3. Given four choices, participating students will select "energy and growth" as the main reason that people and animals need food.
4. Given four choices, participating students will select "plants" as a common food item for both people and animals.
5. Given four choices, participating students will select "sunlight, water, and air" as things a plant must have in order to grow.

Student Activities	Teacher Suggestions
1. (Objectives 1,5) Water Use Discussion 1. Suggest ways you use water. 2. Determine which uses of water listed are most important.	1. (Objectives 1,5) Water Use Discussion 1. Begin the discussion by asking the students to give you ways they use water. List them on the chalkboard. 2. After you have listed all the uses of water, place them in order of importance. 3. Point out that people <u>can live</u> without bathing. 4. Point out that people <u>can live</u> without clean clothes. 5. Also point out that bathing and clean clothes help people to be more pleasant and healthy, which helps people to live longer. 6. You might point out that some of people's water requirements are met through the food they eat.

Student Activities	Teacher Suggestions
2. (Objective 1) Animal's Needs for Water 1. Think of ways students and animals use water. 2. Discuss similar and different ways children and animals use water.	2. (Objective 1) Animal's Needs for Water 1. Compare an animal's need for water to a human's needs. 2. Put a student's name on the board. By it, put the name of an animal--such as a cat or raccoon. You might want to use a particular student and his pet. 3. Make a list of the ways that the student uses water--list them under his name. 4. Make a list of the ways that the animal uses water. List them under its name. 5. Compare the two lists. Check for differences in water uses. Check for common water uses. 6. Try to determine each one's greatest need for water.
3. (Objectives 1,5) An Imaginary Camping Trip 1. Make plans for a two-day and two-night camping trip. List everything you will need. 2. You will have to carry everything to the campsite yourself in a backpack.	3. (Objectives 1,5) An Imaginary Camping Trip 1. Have your class prepare for a camping trip. They will camp for two days and two nights. 2. The campsite will be located away from all stores and modern conveniences. 3. You will have to hike to the site and all supplies must be carried. 4. Have the students help prepare a list of things they will need. This can be a group activity. You can put the list on the board. 5. After the list has been prepared, borrow a pack. Try to determine if all the items listed can be carried in the pack. 6. Eliminate, with the class, those items that are not necessary.

Student Activities

4. (Objectives 1,2,3,4,5)

   A Space Trip

   Plan a trip to the moon, including a moon walk. Be sure to include all items necessary for life.

5. (Objectives 2,5)

   Uses of Air

   1. Help make a list of ways you use air.
   2. Determine what is in air.
   3. How long can you go without water? One hour? One day? One week?
   4. How long can you go without food? One hour? One day? One week?
   5. How long can you go without air? One minute? Two minutes? An hour?

Teacher Suggestions

4. (Objectives 1,2,3,4,5)

   A Space Trip

   1. Help the students plan a trip to the moon.
   2. The emphasis in this activity should be on planning for the basic needs for the astronauts. The space capsule and arrangements for blast-off have already been provided.
   3. Remind the students that once they are in the capsule they will not be able to get the main things they need from the earth.
   4. They will have to take along the necessary items to keep them alive and well.
   5. Remind them that there will be a moon walk. They must provide life's necessities for that too.

5. (Objectives 2,5)

   Uses of Air

   1. Have the students make a list of the ways they use air.
   2. Point out that air is used to cool and dry things and that living things breathe parts of the air.
   3. Emphasize that air is made up of several different things—oxygen being the most important part to most living things.
   4. Emphasize the great need people and animals have for oxygen.
   5. Compare humans and animals need for oxygen to their need for water.

Student Activities	Teacher Suggestions
6. (Objectives 2,5) A Filmstrip Lesson On Air View and discuss filmstrip, Primary Science in Our Lives.	6. (Objectives 2,5) A Filmstrip Lesson On Air 1. This lesson is a part of a filmstrip series entitled Primary Science in Our Lives. In Topeka, this series is available through Special Services. 2. This filmstrip illustrates the parts of air and the necessity of air. 3. Read the poem, "A Ride With The Wind," after you use the filmstrip (see Appendix III).
7. (Objectives 1,2,3,5) Basic Needs Poster-Bulletin Board Make a list of all living things that must have air. Do the same for food, water, and shelter.	7. (Objectives 1,2,3,5) Basic Needs Poster-Bulletin Board 1. Prepare a poster or a bulletin board display of the basic needs for life. 2. Instructions and a model for the display are listed in Appendix IX.
8. (Objectives 1,2,3,5) Basic Needs Discussion 1. Look at the pictures, or words, on the board. 2. List those things that a person must have to stay alive--they are absolutely necessary. 3. Determine those things listed that are needed only to help you be more healthy and pleasant.	8. (Objectives 1,2,3,5) Basic Needs Discussion 1. Make a display using pictures from magazines or use the chalkboard to list items. 2. Use the columns shown below: Column 1: Things you must have for life. Column 2: Things you need in order to be healthy and pleasant. 3. Such things as oxygen, water, food and shelter should be listed under column 1. Different uses of water could be placed in different columns.

Student Activities	Teacher Suggestions
	4. Such things as soap, toothpaste, and deodorants would go under column 2. 5. The two columns and their listings could be prepared in advance by you with the words placed randomly in the two columns. You could then have the students place them in the proper column. 6. Note: Basic needs for plants (sunlight, air-carbon dioxide, water, and minerals). Basic needs for animals (food, oxygen, and water).
9. (Objective 5) Plant-Growing Experiment 1. Plant seeds and grow them under different conditions. 2. Observe and record growth every day. 3. Determine the best growing conditions.	9. (Objective 5) Plant-Growing Experiment 1. This experiment is designed to show a plant's need for air, water, and sunlight. 2. Begin this experiment before you actually begin to use the unit. The seeds will need some time to grow so that you can see some results by the time you reach this point. 3. Use the same soil for all groups. 4. You will need some quick-growing seeds, such as radishes, for this experiment. You will also need some pans that will hold soil and moisture. 5. Divide the class into small groups for this experiment. 6. Each group should plant approximately the same number of seeds at the same time. 7. Be sure that each group follows the directions for planting and caring for the seeds and plants. 8. Have one group put their seed pan where it will receive plenty of sunlight. Cover it with transparent plastic. Do not water at all. 9. Have one group put their seed pan in a very dark place--water regularly--do not cover it. 10. Have one group put their seed pan where it has plenty of sunlight and air, water regularly. Do not cover.

Student Activities	Teacher Suggestions
	11. Have one group set their seed pan where it will receive plenty of sunlight and air. Do not water. Do not cover. 12. Keep a progress chart on each seed pan. Chart should list the date the seeds were planted and the conditions under which they are being grown. Have the students observe the seeds every day and record their observations.
10. (Objectives 2,4,5) View film: Green Plants and Sunlight.	10. (Objectives 2,4,5) Film: Green Plants and Sunlight 1. This film is in the Topeka schools' Film Library. Schedule it through your own school's media center. 2. This film deals with plants and how they grow. 3. It stresses photosynthesis. 4. Preview the film in order to decide how best to use it with your class. 5. See Appendix II for a synopsis of the film.
11. (Objectives 3,4) Food Discussion 1. Can you name some plants that people eat? 2. Can you tell where your meat comes from? (Steak, pork chops, bacon, mutton, lamb chops, hamburger, liver, etc.) 3. Can you name some plants that some animals eat? Do people and animals sometimes eat the same kind of plants? 4. Do animals eat meat? Do animals and people sometimes eat the same kind of meat?	11. (Objectives 3,4) Food Discussion 1. If a home economic specialist is available, bring her in for a demonstration on foods. 2. Use pictures of foods or real foods when available. 3. Foods such as plants, fruits, and meats should be used. 4. Discuss the foods relative to taste and what it does for a person. 5. Point out that people and animals have some foods in common. People eat plants--so do animals. People eat meat--so do animals.

Student Activities	Teacher Suggestions
12. (Objectives 3,4) Energy Demonstration Conduct, or observe, the peanut experiment on energy.	12. (Objectives 3,4) Energy Demonstration 1. You can do this demonstration while the class watches or you may want each student to do it individually. 2. This demonstration should illustrate that food does contain energy and it is passed along to whoever eats it. 3. Provide the student with a peanut and a paper clip. Straighten the clip so that it can be stuck into the nut. Apply a flame to the peanut. It will begin to burn after a short time of exposure to the flame. Caution should be used to avoid burning fingers. 4. The nut contains oil which helps it burn. 5. The nut burns and gives off heat--heat is energy. 6. This is what happens to food after it is eaten--our bodies burn food chemically thus giving us energy to do things.
13. (Objectives 3,4) View and discuss film: Plants Make Food	13. (Objectives 3,4) Film: Plants Make Food 1. This film is in the Topeka schools' Film Library. Schedule it through your own school's media center. 2. The film shows how a plant makes food using sunlight, water, and other things. 3. It points out how plants are important as a source of food. 4. See Appendix II for a synopsis of the film.

Student Activities	Teacher Suggestions
14. (Objectives 3,4) Food Puzzle Complete the Food Puzzle by finding and circling the letters spelling the different foods pictured.	14. (Objectives 3,4) Food Puzzle 1. See Appendix IV for a copy of the food puzzle. This copy can be duplicated. 2. The instructions for the puzzle are included in the appendix. 3. Use this as an individual or as a group activity.

TOPIC II: Food Getting Among Animals

Behavioral Objectives:

6. Given four choices, participating students will select "grass ——— rabbit ——— hawk" as the correct food chain.
7. Given four choices, participating students will select "fox" as an example of a predator.
8. Given four choices, participating students will select "rabbit" as an example of an animal of prey.
9. Given four choices, participating students will select "plant" as an example of a producer.
10. Given four choices, participating students will select a "hawk" as an example of a consumer.

Student Activities	Teacher Suggestions
15. (Objectives 6,7,8,9,10) Food Web - Food Chain 1. Learn all you can about your plant or animal. 2. Participate in the food web activity. 3. Discuss the food web terminology and the relationship of the plants and animals.	15. (Objectives 6,7,8,9,10) Food Web - Food Chain 1. You will need a good supply of yarn and poster board or construction paper for name labels. 2. Print the name of an animal or plant on each label. Suggestions are listed below. Coyote, Fox, Mouse, Grass Grasshopper, Rabbit, Lettuce, Hawk Snake, Deer, Frog, Insect Fly, Fish, Raccoon, Nut 3. Have students become familiar with the animal or plant assigned them so they will know what it eats, what eats it, where it lives, etc. 4. Arrange the students in a circle. It will probably be best for them to be sitting.

Student Activities	Teacher Suggestions
	5. Begin with one animal--ask him to look around the circle and decide what, or who, he would eat. When he makes his choice, connect them with a piece of yarn. 6. Continue around the circle. Be sure to ask consumers what they eat last because they don't eat anything, they make their own food. When the activity is completed, the different plants and animals will be inter-connected--thus forming food chains and a food web. 7. Point out that everything depends on something else. 8. See Appendix V for a copy of a food web.
16. (Objectives 6,7,8,9,10) View film, Food Getting Among Animals.	16. (Objectives 6,7,8,9,10) Film: Food Getting Among Animals 1. This film is in the Topeka schools' Film Library. Schedule it through your own school's media center. 2. Predator-prey relacionships are shown. 3. You might discuss producers and consumers. 4. See Appendix II for a synopsis of the film.
17. (Objectives 6,7,8,9,10) View film, How Nature Protects Animals.	17. (Objectives 6,7,8,9,10) Film: How Nature Protects Animals 1. This film is in the Topeka schools' Film Library. Schedule it through your own school's media center. 2. This film covers many of the same concepts as those listed for Activity 16. 3. See Appendix II for a synopsis of the film.

Student Activities	Teacher Suggestions
18. (Objectives 6,7,8,9,10,16) View film, The Prairie	18. (Objectives 6,7,8,9,10,16) Film: The Prairie 1. This film is in the Topeka schools' Film Library. Schedule it through your own school's media center. 2. This film is very good--closely related to Kansas. 3. See Appendix II for a synopsis of the film.
19. (Objectives 6,7,8,9,10) Food Gathering Characteristics 1. View and discuss different mouths and feet of animals. 2. Determine why they are different.	19. (Objectives 6,7,8,9,10) Food Gathering Characteristics 1. Appendix VI shows feet and beaks of certain birds. You can make transparencies or duplicates from this copy. 2. Point out that you can tell a lot about an animal by looking at its mouth (beak) and feet (claws). 3. You can probably tell what kind of habitat an animal uses by looking at its feet. 4. Discuss predator-prey relationships.
20. (Objectives 6 through 17) Habitat Activity 1. Put each animal in the proper habitat. 2. Make food chains for each area.	20. (Objectives 6 through 17) Habitat Activity 1. See Appendix VII for instructions for this activity. Duplicates can also be made from this copy. 2. Match animals with their proper habitats. 3. While matching animals and habitats, emphasize predator-prey relationships and food chains for each habitat. (Algae, minnow, frog)

TOPIC III: Field Trip - Wildlife Homes and Food Supply

Behavioral Objectives:

11. Given four choices, participating students will select "because of shelter and food" as the reason that a squirrel lives in a woodland area.

12. Given four choices, participating students will select "pond" as a home for bugs, frogs, turtles, and fish.

13. Given four choices, participating students will select a "grassland" as the place where a hawk would get most of its food.

14. Given four choices, participating students will select a "pond" as the area that supplies wildlife food, drink, and homes.

15. Given four choices, participating students will select "grass——— mouse——— hawk" as an example of a grassland food chain.

16. Given four choices, participating students will select "woodlands——— squirrel——— man" as an example of a woodlands food chain.

17. Given four choices, participating students will select "bugs——— frog——— fish" as an example of a food chain for a pond area.

Overview of the Field Trip

The field trip is planned to achieve specific objectives within the unit. A schedule for the day's activities is provided. This schedule is very flexible. Conditions in different classes, weather, and site location may dictate changes.

The morning activities are planned to achieve the cognitive objectives set forth for the field trip. Leisure activities take up most of the afternoon.

See Appendix I for tips on field trip preparation.

Field Trip Schedule

8:45 a.m.	Leave School	
9:30	Arrive at Lake Perry	
9:30 - 9:45	Students explore site staying within sight of leaders.	
9:45 - 10:30	Session I.	Group 1 - Pond Study Group 2 - Woodland Study Group 3 - Grassland Study
10:30 - 11:15	Session II.	Group 1 - Grassland Study Group 2 - Pond Study Group 3 - Woodland Study
11:15 - 12:00	Session III.	Group 1 - Woodland Study Group 2 - Grassland Study Group 3 - Pond Study
12:00 - 12:45	Lunch	
12:45 - 1:15	Visit the "Old Barn."	
1:15 - 2:00	Ride the Monocable.	
2:00	Leave the site--return to school.	

Student Activities	Teacher Suggestions
21. (Objectives 11,16) Woods Study Observe and discuss a woodland with your group leader.	21. (Objectives 11,16) Woods Study 1. Take the students to the woodland area that has been designated for this session. 2. Determine how this area supplies food for animals. What are the producers? 3. Look for signs of the animals that use this area--nests in trees, nuts, tracks, and holes in trees. 4. As the leader directs the students in a "look and discuss" session, begin to develop the relationships that exist between this type of area and animals that rely on it--why does a squirrel use a tree for a home? Why does it eat nuts? Why doesn't a hawk hunt in the woods instead of meadows? 5. Develop food chains that would be common to the area. Have the students role-play the food chain.
22. (Objectives 13,15) Grass Area Study Observe and discuss a grassland area as you hike with your group leader.	22. (Objectives 13,15) Grass Area Study 1. Take the students to the grass area that has been designated for this session. 2. Determine how this area supplies food for animals. 3. Look for signs of animals that use this area--look under the dead grass--look for holes and mouse trails under the grass. 4. As the leader directs the students in a "look and discuss" session, begin to develop the relationships that exist between this type of area and the animals that rely on it. Why do mice make their home in the grass? Why do hawks soar over the meadows? How many different plants can you spot in the grassland? What is the connection between rabbits and grasslands? Coyotes and grasslands?

Student Activities	Teacher Suggestions
	5. Develop food chains that would be common to the area. Have the students role-play the food chains.
23. (Objectives 12,14,17)	23. (Objectives 12,14,17)
Pond Study	Pond Study
Observe and discuss the pond area.	1. Take the students to the pond designated for this session. 2. Survey the pond for signs of life. Look for plants, bugs, frogs, turtles, and fish. 3. Look around the bank of the pond. Look for tracks that will tell of the kinds of animals that use the pond. 4. As the leader directs the students in a "look and discuss" session, begin to develop the relationship that exists between the pond and the animals that rely on it. Do some animals that live elsewhere use the pond? Why? Does the pond provide food? Homes? Drink? What is the relationship between the pond and a raccoon? A deer? A bird? A fish? 5. Discuss algae and its importance as a producer.

TOPIC IV: Classroom Follow-Up - Man and Wildlife

Behavioral Objectives:

18. Given four statements concerning wildlife, participating students will select "most wildlife is important" as the statement that is most accurate.

19. Given four choices, participating students will select "floods, fires, cold, and people" as the group that destroys wildlife.

20. Given four choices, participating students will select "hawks, squirrels, fish, deer, and owls" as the group of animals that are protected by law in Kansas.

21. Given four choices, participating students will select "people" as the greatest threat to wildlife.

Student Activities	Teacher Suggestions
24. (Objectives 7,9,13,14,17,18,19,21) View and discuss film, Wood Duck's World	24. (Objectives 7,9,13,14,17,18,19,21) Film: Wood Duck's World 1. This film is in the Topeka schools' Film Library. Schedule it through your own school's media center. 2. This film deals with a family of Wood Ducks. It shows how nature uses different methods to reduce the number of animals in the environment. 3. Predators are shown. 4. Man's part in the balance of nature is portrayed. 5. Food chains can be developed from this film. 6. Laws relating to duck hunting can be discussed. 7. See Appendix II for a synopsis of the film.

Student Activities	Teacher Suggestions
25. (Objectives 18,19,21) Discuss the story, "The Big Flood"	25. (Objectives 18,19,21) Story: "The Big Flood" 1. This story is taken from Ranger Rick, March, 1967. A copy of this story is included in Appendix VIII. 2. Read the story to the class and then discuss it. You may want to lower the vocabulary and use the story as a reading assignment. 3. Point out that careless people started the fire that eventually led to the destruction of animal homes and life. 4. Point out that when the trees were burned off there was nothing to slow the water running off after a rain--there were very few roots to hold the rain after it hit the ground. Most of the rain ran off the land instead of soaking in. 5. Point out that by being more careful with fire, trees, soil, animals, and animal homes could have been saved.
26. (Objectives 18,19,21) 1. Find all information you can about the area assigned you. Talk to people and read books, newspapers, and magazines. 2. Determine what might have happened to wildlife because of the event you are studying.	26. (Objectives 18,19,21) Reports on floods, fires, and severe winters. 1. Divide the class into three groups. Put one very responsible student with each group. 2. Give each group the responsibility to make a report on either floods, fires, or severe winters. 3. The reports should be geared to the destruction that might have occurred to wildlife because of the event. 4. The newspaper office can be a good source of information for these reports. Stories of big floods, forest fires, and very severe winters would be carried by newspapers. 5. The weather bureau may have records regarding severe winters.

Student Activities	Teacher Suggestions
	6. The State Game and Fish Department could be an information source. 7. You may choose to do this as a class activity just discussing a particular event.
27. (Objectives 20,21) Determine all you can about laws relating to the area assigned your group.	27. (Objectives 20,21) A study of laws relating to wildlife. 1. Divide the class into three groups. Put a responsible student with each group. Give one group the responsibility of reporting to the class about the laws regarding the hunting of animals with four legs. 3. Give one group the responsibility of reporting to the class about the laws regarding the hunting of birds (any animals that fly). 4. Give one group the responsibility of reporting to the class about the laws on fishing. 5. The reports should include: who must buy a license to hunt or fish, some of the different seasons on hunting, why there must be seasons, why there must be bag limits. 6. Sources: The State Game and Fish Department, local game protectors, sporting good stores, bait shops.

Appendix I

Field Trip Preparation and Tips

1. Advise the students to wear old clothes and shoes.
2. The class should be divided into three groups.
3. Use masking tape for name tags and group numbers.
4. Students need sack lunches with the student's name on the sack.
5. Caution against picking up snakes or insects.
6. Advise the students to stay with their assigned leader.
7. Go over restroom procedures--where the restrooms will be located and the kind of restrooms.
8. Give instructions for disposal of trash such as lunch sacks, etc. A plastic bag or a box should be used for a trash bag. If the site has litter barrels, the trash can be put in it.
9. Prepare the students by going over the schedule of the day's activities.
10. The program specialist will assume the leadership of the trip.

Appendix II

Film Synopsis

Green Plants and Sunlight EBF 11 Min. C

Illustrates how green plants capture the sun's rays and manufacture food.

Plants Make Food C-W 10 Min. C

Two children learn something of the process by which plants make food (photosynthesis): they discover the importance of plants as a source of food.

Food Getting Among Animals Moody 13 Min. C

A fascinating variety of animals' food-getting equipment and eating habits are illustrated, ie, anteater with sharp claws and sticky tongue, rattlesnake's ability to find prey in the dark, archer fish that shoots insects out of the air, and others.

How Nature Protects Animals EBF 10 Min.

Examines phenomena of protective adaptation of various animals to different environments. Shows animals in their natural habitats and illustrates different kinds of protection for the animals.

The Prairie Barr 17 Min. C

Tells what and where the North American prairie is and maps and describes the physical features, vegetation and animal life in its three major areas: the Eastern Region with the most rainfall; the drier short-grass lands that reach to the foot of the Rockies; and the middle area where Kansas is located.

Wood Duck's World Ducks Unlimited 30 Min. C

An excellent study of a year in a wood duck's life. Relationships between predators, prey, clutch size, and population growth are explained in simple applied fashion which provides a most realistic picture of the growth, success, and death of wild creatures.

Appendix III

A Ride With the Wind
- Margo Duryea

I talked to the wind,
And the wind talked to me.
I said, "I have one wish.
The sky to see."

The winds said, "Let's go
Where the snowflakes are.
We might even see
Where they keep that star!

So off we went
Flying through the air,
Up above the clouds
With the wind in my hair.

Whee-e-e, what fun
To go soaring like this!
I never dreamed
I would get my wish.

As we flew through the sky,
We saw all kinds of things.
The snowflakes greeted us,
And the stars looked like kings.

So this is the place
Where the weather is made.
And this is where
The planets fade.

Look over here
At the Milky Way.
Gee, I'm so glad
We went flying today.

But I think we'd better get
Started back
Or I might be missed,
As a matter of fact.

As we rode a snowflake
Back to the ground,
I thought of its changing
Without making a sound.

It becomes the water
For the thirsty plants
That feed you and me
And even the ants!

"Oh, such a fun trip,"
The wind and I said.
But then I woke up
And was home in my bed!

*Reprinted from: Ranger Rick, March, 1967.

Appendix IV

Food Puzzle

In this puzzle there are eighteen foods. Read down, across, and diagonally to find the names of these foods. You will see the foods pictured around the letters. List the names of the foods on the blank below.

1. _____ 10. _____

2. _____ 11. _____

3. _____ 12. _____

4. _____ 13. _____

5. _____ 14. _____

6. _____ 15. _____

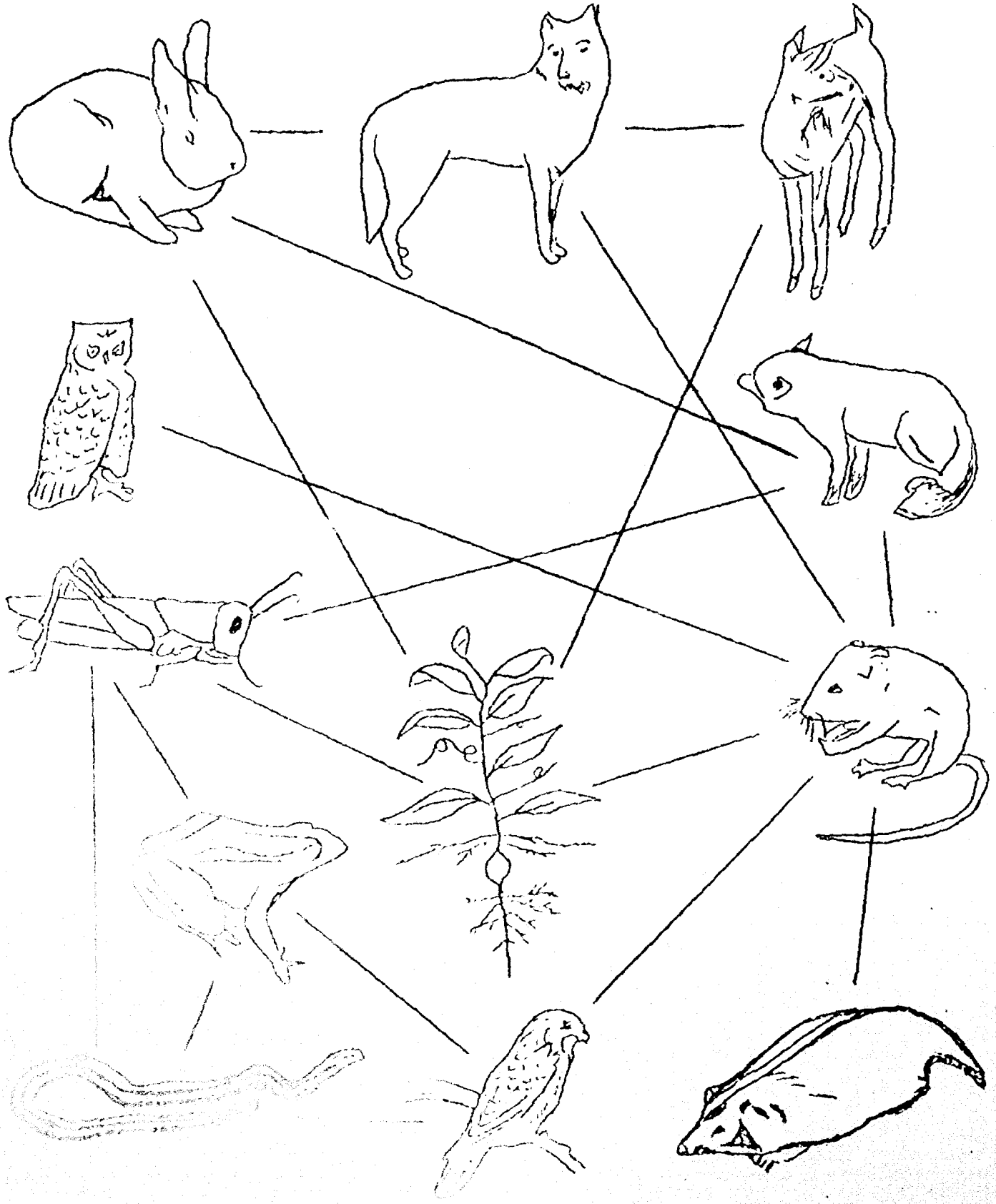
7. _____ 16. _____

8. _____ 17. _____

9. _____ 18. _____

Appendix V

A POSSIBLE FOOD WEB



Appendix VI

Food Gathering Characteristics

For teacher reference when using the bird feet diagram.

1. Leg and foot of a water bird that feeds by wading in shallow water and shoreline areas. Foot not adapted for swimming.

2. Leg and foot of grassland bird. Many forest birds have similar feet. Toe nails tend to be developed for digging among ground litter. Some of the perching birds have two toes forward and two backward for grasping tree limbs or bark--the woodpecker for example.

3. Foot of a predatory bird. The foot is very muscular and has well-developed claws for holding prey. The claws are also very sharp and adapted for tearing material apart.

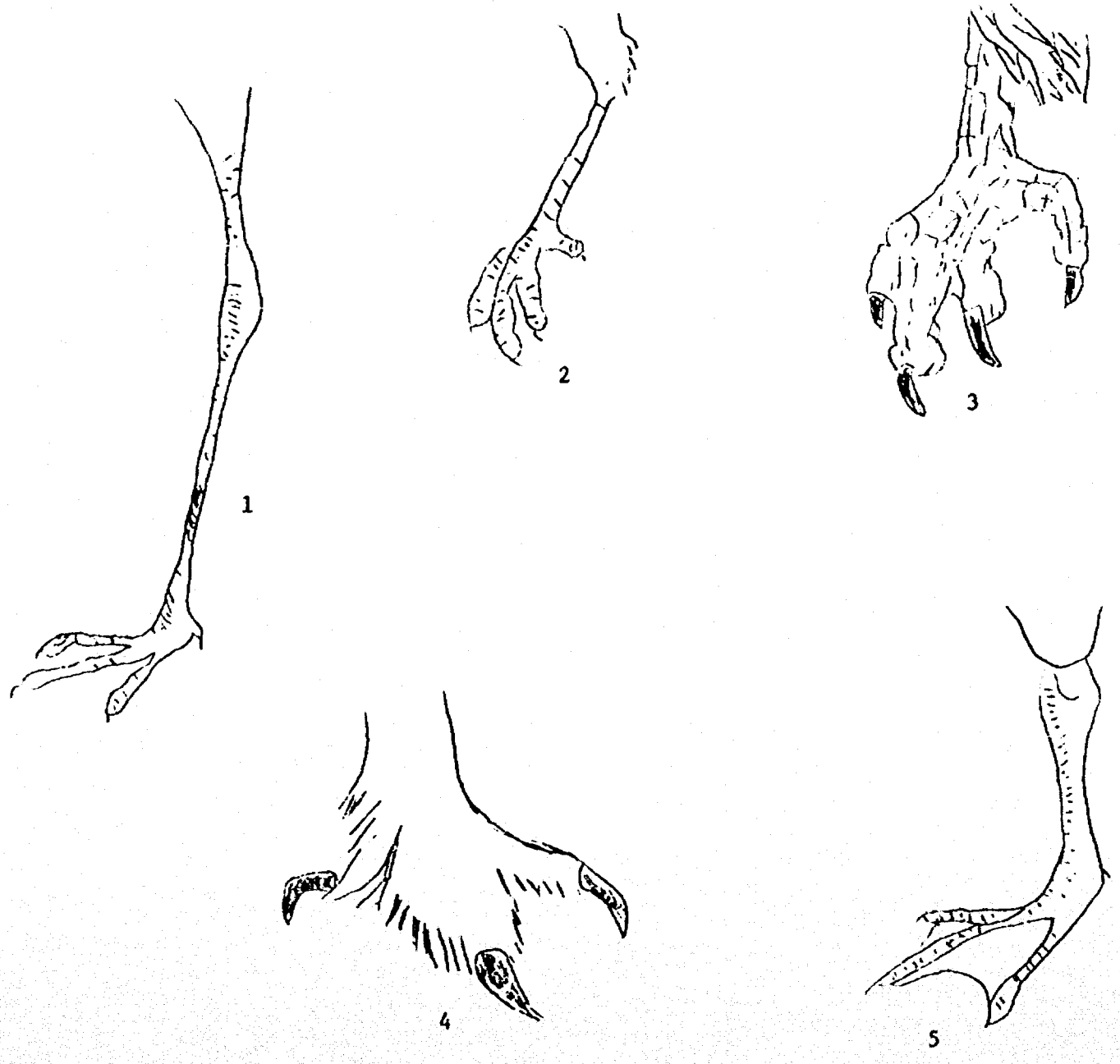
4. Foot of a bird living in snow covered region. Note, the feathers are used to help support the weight as well as keep the foot warm.

5. Foot of a water bird. Note the web between the toes. When toes are spread, the foot acts as a paddle or oar.

Appendix VI

Food Gathering Characteristics

WHAT TYPE OF AREA, OR HABITAT, WOULD YOU EXPECT TO FIND A BIRD WITH EACH OF THE FOLLOWING TYPE OF FEET?



Appendix VI

Food Gathering Characteristics

For teacher reference when using the bird beak diagrams.

1. Beak of a predatory bird. Note the hooked end used for grasping, and the apparent strength of the beak.

2. Beak of insect and grain eater. Not a highly specialized beak. This bird beak is used for eating only those foods requiring little or no breaking before swallowing.

3. Beak of a grain-eating bird. Note the short, stout structure. Well adapted for cracking various grains.

4. Beak of a nectar-eating bird. Note the long, tube-like structure. Adapted for reaching into large flowers. Nectar is sucked up through the beak.

5. Beak used nearly the same as number three.

6. Beak used for drilling into wood. The beak is sharp pointed, stout, and reasonably long for reaching insects and larva under tree bark.

7. Large fishing bird beak. Adapted for capturing and collecting larger fish. Beak opens wide and fish can be collected in the pouch under the beak.

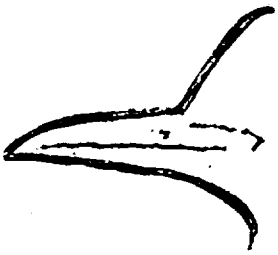
8. Beak of a bottom-feeding water bird. Beak is wide and used as a shovel. When the mouth closes, excess water squirts out the sides, then food can be swallowed.

Appendix VI

Food Gathering Characteristics

WHAT KIND OF FOOD DO YOU THINK A BIRD WITH EACH OF THESE TYPES OF BILL WOULD EAT?

1



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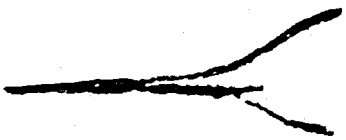

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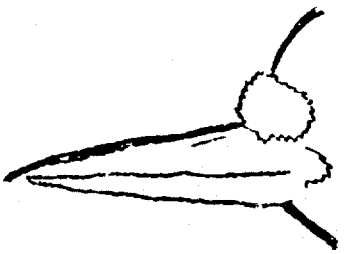

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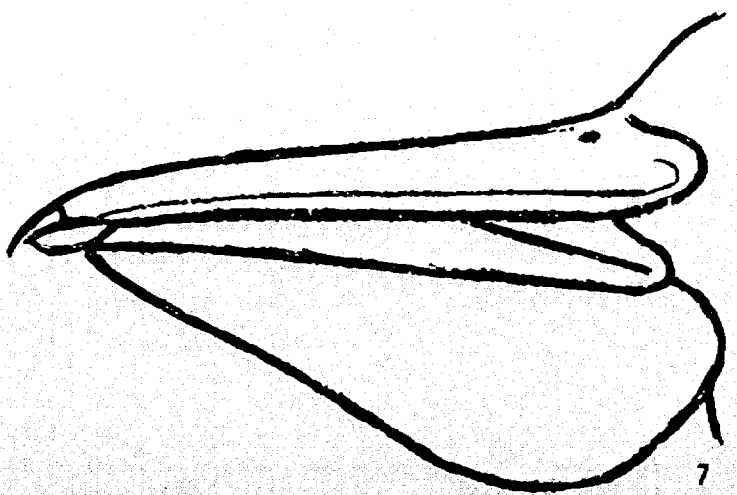

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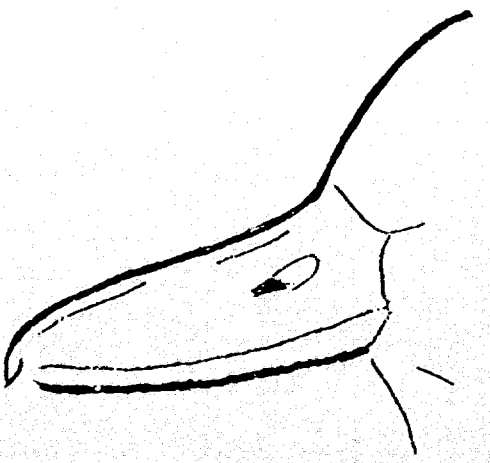

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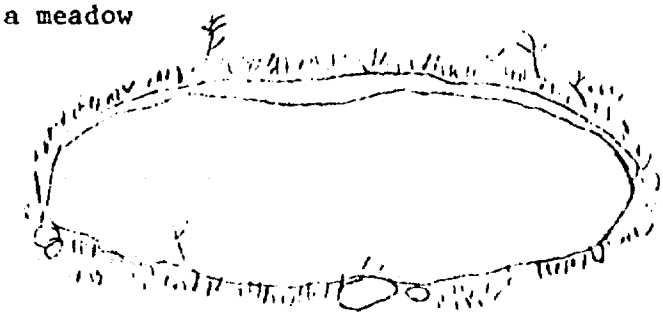
Appendix VII

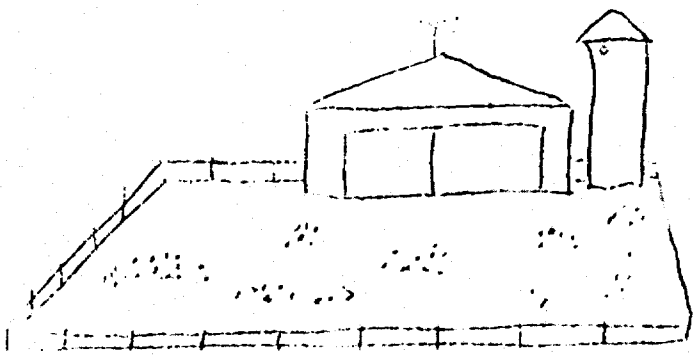
Nature Words

On the left are pictures of habitats of animals. A habitat is a place where animals are usually found. Match the name of each animal with the correct picture of where the animal lives by writing the number of the picture in each blank.

1. pond in a meadow



2. barnyard



3. forest

4. jungle

1. elephant_____
2. rabbit_____
3. skunk_____
4. lion_____
5. butterfly_____
6. pig_____
7. chipmunk_____
8. goldfish_____
9. tiger_____
10. deer_____
11. squirrel_____
12. duck_____
13. minnow_____
14. hen_____
15. zebra_____
16. rooster_____
17. cow_____
18. frog_____
19. peacock_____
20. monkey_____
21. parrot_____
22. lamb_____
23. alligator_____
24. leopard_____

Appendix VIII

The Big Flood*
-J. A. Brownridge

All day the rain poured down and it kept on after dark. Even Rick Raccoon, who liked to roam the woods at night, stayed in his home in Hollow Oak.

It was snug and dry there, but Rick could not sleep. He kept thinking of the bare, burned-off hill above Clear Creek. Last summer a careless camper had started a fire near the creek bank. Before it was brought under control, a whole hillside of trees and bushes was destroyed. There would be no limbs or branches or twigs to break the heavy downpour of rain; no roots to hold the water where it fell.

"If only people had planted new trees and shrubs on the hillside right after the fire," thought Rick. "But I guess they were busy with other things and thought they'd wait until next year."

But Rick knew that rains don't wait. And this long, heavy rainfall could start a flood. As the night turned to gray morning, Rick remembered that Ranger Tom had promised to store some bags for sand at the Deep Green Wood Ranger Headquarters where he and his friends kept shovels and fire-fighting equipment.

He hurried to headquarters, hoping Ranger Tom had not forgotten his promise. Sure enough, there were the bags. Rick hardly had time to heave a sigh of relief when Billy Beaver came in puffing.

"Rick," he gasped, "you'd better come quickly. Clear Creek is rising fast. I'm afraid we're going to have a flood!"

"Sound the Ranger's alarm, Bill. I'll run ahead to see what can be done. Get everyone to bring some bags and a shovel!" Rick took a shovel and all the bags he could carry and raced away.

Billy Beaver grabbed the hammer and pounded on the Ranger alarm to summon all the animals to headquarters to fight another danger to their homes.

As soon as Rick got to Clear Creek he saw where the trouble had started. The rain was pouring down the burned-off hillside in torrents. It was carrying with it precious topsoil, rocks, dead tree trunks and all kinds of trash and dumping it into a muddy, messy, swollen stream.

Clear Creek had angry waves licking at its lowest banks as if annoyed by all this dirt being dumped into its usually quiet, clean bed. At any moment it would spill over into the low woods beyond the hill. Some of the animal homes would be flooded and perhaps lives would be lost.

There was not a moment to spare. Rick grabbed his shovel and started filling bags with sand. The other Rangers came rushing to his side. Rick gave orders:

"Ollie, you and Davey help fill these sandbags and load them on Terry's back.

"Terry, you carry the sandbags over to me and we'll try to build a dike to hold the water back."

*Reprinted from Ranger Rick, March, 1967.

All the animals worked furiously to hold back the rising tide. But still the muddy water rose and threatened to break through at a different place.

Quickly Ranger Rick assigned another group to fight the new threat. Then suddenly . . . tragedy.

Sammy Squirrel was struggling to pull a sandbag into place and didn't notice that the fast-flowing water had worn away part of the stream bank. The edge of the bank was ready to cave in under the slightest weight.

Down went Sammy into the angry, swishing water. Down, down he went until he was sure he'd never come up.

"Help, Rick!" shouted Davey Deer, who had been working with Sammy. All the animals left their work and watched with terror as Sammy struggled in the flood. Frantically he grabbed a branch floating by and pulled himself up. But the water was rough and wild and it was like riding a bucking bronco. Sammy surely would drown if help didn't reach him quickly.

"Ollie Otter, you and Billy Beaver run as fast as you can to the big bend in the creek," ordered Rick. "The water slows down a little there and maybe you can swim out and get him. I'll try to reach him at the stone bridge."

Off they all raced. Ollie and Billy took a shortcut through the woods to the big bend. Rick rushed down to Stone Bridge. Out to the middle of the bridge he went where the roar of rushing water almost deafened him. He leaned far out as Sammy swept closer. Sammy reached for Rick's paw . . . but missed. Under the bridge he went. The other animals on the bank moaned.

"No time for that," snapped Rick. "Hurry to big bend in case Ollie and Billy need help."

Downstream they saw their two brave friends leap into the rushing creek and fight their way out to where Sammy's tree branch would be coming. Suddenly there it was. Both animals grabbed for it . . . and caught it. Now came the desperate swim back to shore.

"Hurray!" shouted all the animals. "They've got him."

"He's not out yet," warned Rick. Rudy Duck, you take the end of this rope out and drop it to Sammy. He can hold it and we'll all help pull them in."

Away Rudy flew with the end of the rope in his bill. He swooped down and dropped it right on target. Then everyone pulled with all his might until Sammy was close enough to leap onto solid ground.

There he crouched, wet and shivering and still frightened by his narrow escape.

"Th-th-thanks," he stuttered through chattering teeth.

"Nurse Zelda Possum, you take Sammy home and get him warm and dry," said Rick. "The rest of you go back to work. But be careful!"

On they struggled through a long, long day filling sandbags and piling them up. At last the clouds began to roll away. A rosy sunset showed through and the rain stopped. Soon the river stopped rising. Another battle to save their homes had been won.

Wearily they returned to Ranger headquarters.

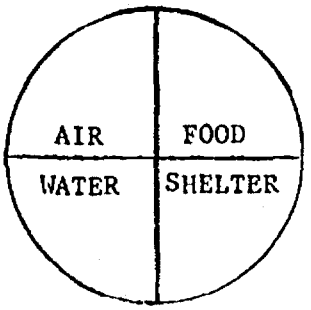
"You're all heroes," said Rick. "But to Ollie and Billy we must give our biggest hero medal for saving Sammy."

Ollie chuckled. "Rudy Duck should get a special medal for marksmanship. He sure was right on target with that rope he threw to Sammy!"

Appendix IX

Basic Needs of Life

1. Divide the poster, or board, into four quarters.
2. The quarters should be labeled as shown in the diagram below.



3. Put the picture, or name, of things that must have air into that quarter.
4. Do the same with the food, water, and shelter quarters.
5. You will find that nearly all things fit into all the quarters.
6. Plants may be the exception to number five above. For example, a plant must have some parts of the air to grow. It must have food and water to live and grow. However, many plants grow very well without shelter.

Appendix X

Instructions for Administering Student Test

1. This test may be given individually or as a group.

2. The student's first and last name should be on the test paper.

3. Each question relates to a specific objective (question 1 relates to objective 1). If you do not teach a certain objective, skip that question.

4. The questions may be read to the students.

5. Feel free to lower the vocabulary of the questions. Be sure the students understand what the question is asking.

6. There is only one answer per question.

7. Students may circle the letter to indicate their choice, or they may underline their answer. As a teacher, you are free to change the method by which they indicate their answers to fit your own situation.

8. The correct answer for each question is listed below.

1.	(B)	8.	(B)	15.	(C)
2.	(B)	9.	(D)	16.	(D)
3.	(C)	10.	(B)	17.	(A)
4.	(B)	11.	(A)	18.	(B)
5.	(B)	12.	(D)	19.	(A)
6.	(C)	13.	(C)	20.	(C)
7.	(A)	14.	(B)	21.	(C)

BALANCE OF NATURE

Pre-test 077, Posttest 078

1. Choose the most important use people have for water.

   A. water for washing clothes
   B. water for drinking
   C. water for bathing
   D. water for watering lawns

2. Which of these do most things need in order to live?

   A. eyes
   B. oxygen
   C. clothes
   D. legs

3. What is the main reason that people and animals eat food?

   A. to be smart and rich
   B. for fun and to run faster
   C. for energy and growth
   D. to be beautiful or handsome

4. Which of the things listed below would both people and animals eat for food?

   A. coffee
   B. plants
   C. water
   D. insects

5. Which of the four groups has the most important things that a plant must have in order to grow?

   A. sunlight, clouds, water
   B. water, sunlight, air
   C. air, care, soil
   D. sunlight, water, shade

6. Choose the answer that shows a correct food chain.

   A. plant ——— hawk ——— rabbit
   B. hawk ——— plant ——— rabbit
   C. plant ——— rabbit ——— hawk
   D. rabbit ——— plant ——— hawk

7. Choose the animal that is a predator.

   A. fox
   B. deer
   C. mouse
   D. cow

8. Choose the animal that would be a prey.

   A. lion
   B. rabbit
   C. bear
   D. elephant

Balance of Nature
Pre-test 077, Posttest 078

9. Which of these is a producer?

A. squirrel C. cow
B. rabbit D. plant

10. Which of these is a consumer?

A. tree C. plant
B. hawk D. water

11. Why do squirrels usually live in a woods area?

A. because of shelter and food
B. because he has a long tail
C. because the trees have leaves
D. because there is plenty of water

12. In which of these places would you find bugs, frogs, turtles, and fish?

A. woods C. grass
B. barn D. pond

13. Where would a hawk get most of its food?

A. woodland C. grassland
B. pond D. lake

14. A pond helps wildlife most by providing:

A. fun, bath, food
B. food, drink, home
C. swim, home, wash
D. drink, warmth, fun

15. Which of these food chains would be best for a grass area?

A. bugs ——— fish ——— raccoon
B. nuts ——— squirrel ——— man
C. grass ——— mouse ——— hawk
D. bugs ——— frog ——— fish

16. Which of these food chains would be best for a woods area?

A. grass ——— rabbit ——— coyote
B. bugs ——— frog ——— turtle
C. frog ——— snake ——— hawk
D. nuts ——— squirrel ——— man

17. Which of these food chains would be best for a pond?

A. bug ——— frog ——— fish
B. grass——— deer ——— coyote
C. bug——— mouse ——— snake
D. hay ——— cow ——— man

18. Which of these statements is true?

A. No animal should ever die.
B. Most wildlife is important.
C. All snakes should be killed.
D. Most wildlife is not important.

19. What destroys wildlife?

A. floods, fires, cold, people
B. fog, air, sunshine
C. plants, rocks, houses
D. planes, boats, rain

20. Which animals are protected by law in Kansas?

A. blackbirds, snakes, rabbits
B. coyote, fox, sparrow, dove
C. hawk, squirrel, fish, deer, owls
D. pigeons, raccoons, mice, frogs

21. Which of these is the greatest threat (danger) to wildlife?

A. animals
B. plants
C. people
D. water