



# STOP, LOOK and LEARN

## About Our Natural World

Nebraska Natural Resources Elementary Education Guide

# **STOP, LOOK and LEARN**

## **About Our Natural World**



Nebraska Natural Resources Elementary Education Guide  
Volume Two, Grades: Third – Fourth

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Questions, Comments or Requests Concerning  
**STOP, LOOK and LEARN About Our Natural World**  
Should be Directed to:

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Nebraska Natural Resources Commission  
Stop, Look and Learn  
P.O. Box 94876  
Lincoln, Nebraska 68509  
(402) 471-2081

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STATE OF NEBRASKA

E. BENJAMIN NELSON, GOVERNOR

# **STOP, LOOK and LEARN**

## **About Our Natural World**

### **Nebraska Natural Resources Elementary Education Guide**

Volume 1: Kindergarten – Second Grade

Volume 2: Third – Fourth Grade

Volume 3: Fifth – Sixth Grade

Developed as part of the  
Nebraska Natural Resources Commission's  
State Water Planning and Review Process

#### **SOIL AND WATER CONSERVATION STRATEGY**

———— in cooperation with ————

Nebraska Department of Education  
U.S.D.A. Soil Conservation Service  
Nebraska Natural Resources Districts  
Nebraska Department of Agriculture – Ag in the Classroom Program  
University of Nebraska, Institute of Agriculture and Natural Resources

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This activity notebook is suggested for the third and fourth grade levels.

It has been developed to promote conservation awareness and understanding for Nebraska elementary school children. This project was developed by a cooperative effort of the 23 Nebraska Natural Resources Districts, U.S.D.A. Soil Conservation Service, Nebraska Natural Resources Commission, Nebraska's Ag in the Classroom Program, Nebraska Department of Education, Nebraska Department of Agriculture and the University of Nebraska-Lincoln Institute of Agriculture and Natural Resources.

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3. Soil--We Can't Grow Without It  
1985 Educator's Guide  
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7. Creative Ways to Cultivate Agriculture in the Classroom  
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14. Conserving Soil  
United States Department of Agriculture Soil Conservation Service
  
15. Soil -- Use and Improvement  
United States Department of Agriculture Soil Conservation Service
  
16. Soil Conservation Topics Education Kit  
United States Department of Agriculture Soil Conservation Service
  
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## **Introduction**

This activities notebook was developed to help teachers provide relevant conservation information for students in an easy and practical manner.

These materials are designed for the teacher to adapt to his/her individual style and teaching needs. The materials can be taught in 5 units; activities can be pulled and use to enrich a core curriculum, or worksheets can be used in skill review.

The Unit Guide lists unit concepts and daily lesson plans enabling a teacher to implement these materials in a unit form.

Each activity lists objectives, subject area, background information (if needed), materials, additional activities, supplemental worksheets to reinforce concepts of each activity, and suggested procedures to provide your students with a hands on experience in conservation. Refer to the Activity Guide to identify topics and basic skills for each activity.

The Worksheet Guide can be used to identify basic skills for each worksheet.

The activities provide needed background information. If you would like more background information, contact one of the following resources in the appropriate area:

### **Soil and Water**

Contact your local Soil Conservation Service or  
Natural Resources District offices.

### **Wildlife**

National Wildlife Federation  
1412 Sixteenth Street N.W.  
Washington, D.C. 20036-2266

Nebraska Game and Parks Commission  
2200 N. 33rd Street  
Lincoln, Nebraska 68683  
(402)464-0641

### **Forest , Trees**

Nebraska State Forest Service  
101 Plant Industry Building  
Lincoln, Nebraska 68583  
(402)472-2944

USDA Forest Service  
Regional Forester  
11177 West 8th Avenue  
Box 25127  
Lakewood, Colorado 80225

There are a few slide/tape shows available on loan from:

USDA Soil Conservation Service  
Nebraska Office  
100 Centennial Mall North  
Lincoln, Nebraska 68508  
(402)437-5300

Ask for: "Soil - We Can't Grow Without It"

15 minutes, discusses the significance of soil to plants, animals and people.

or:

"Water - We Can't Live Without It"

14 minutes, shows how freshwater habitats support wildlife, what threatens our water supply, and how we can conserve this vital resource for future generations.

## Unit Guide

This unit guide lists 5 units, the concepts for each unit and suggested daily activities. For example in Unit 1, Day 1 it is suggested to use We Depend Upon Soils Activity 1 and Additional Activity 1 to reinforce the learned concept. We Depend Upon Soils is the first activity found in the notebook. Additional Activity 1 is found after the procedure of We Depend Upon Soils, it is part of We Depend Upon Soils activity.

### Unit 1 Soil Conservation

#### Concepts

The student will:

- identify soil as a natural resource common to all consumer products
- realize the kinds of living organisms that make their home in the soil
- understand soils are made up of different textures
- realize the varying water holding capacities of different soils and the importance of this to plants
- realize the importance of organic matter in soil
- realize how soil conservation methods can prevent water erosion

#### Suggested Daily Lesson Plan (Activities 1 - 6)

Day 1

"We Depend Upon Soils" Activity 1

Additional Activity 1 to reinforce the learned concept

Day 2

"What's Living in the Soil" Activity 2

Day 3

"Moisture in Soil" Activity 3

Day 4

"Organic Matter" Activity 4

Additional Activity 1 to apply the learned concept

Day 5

"Soil Texture" Activity 5

Additional Activity 1 to reinforce the learned concept and to introduce wind erosion

Day 6

"Soil Loss" Activity 6

### Unit 2 Plant Conservation

#### Concepts

The student will:

- realize how plant roots spread out and hold the soil in place
- realize that their food comes from plants directly or indirectly
- learn how to properly grow and take care of a plant
- learn how water moves to plant parts
- learn about chlorophyll and its importance

- name four things a plant needs to live and grow
- understand a grass community

#### Suggested Daily Lesson Plan (Activities 7 - 12)

Day 1

"Roots Affect the Soil" Activity 7

Day 2

"Plants Drink Water Too" Activity 8

Day 3

"Plants Need Light, Air, Water and Soil to Survive" Activity 9

Day 4

"Growing Plants from Germinated Seeds"  
Activity 10

Day 5

"Do You Eat Plants?" Activity 11

Day 6

"Your Community, My Community" Activity 12

### Unit 3 Water Conservation

#### Concepts

The student will:

- understand the many uses for water and ways to conserve water
- describe three forms of water
- realize the water cycle
- understand ways to prevent pollution of water
- observe and describe succession

#### Suggested Daily Lesson Plan (Activities 13 - 19)

Day 1

"Water Uses" Activity 13

Day 2

"Forms of Water" Activity 14

Day 3

"Rainfall" Activity 15

Additional Activity 1 to introduce more information about the water cycle

Day 4

"The Water Cycle" Activity 16

Day 5

"What's Wrong with the Water" Activity 17

Day 6

"Forest in A Jar" Activity 18

Day 7

"Pond Succession" Activity 19

## **Unit 4 Tree Conservation**

### **Concepts**

The student will:

- discover the parts of a tree
- observe the changes a tree goes through in a year
- discover the uses of a tree
- understand ways leaves provide help to nature
- discover the Nebraska forest industry
- find trees common in their area
- discover ways to prevent forest fires and protect trees
- realize the importance of recycling

### **Suggested Daily Lesson Plan (Activities 20 - 26)**

Day 1

"Adopt a Tree for a Year" Activity 20

Day 2

"Uses of a Tree" Activity 21

Additional Activity 3, The Forest Conservation Mobile

Day 3

"Leaves are Important" Activity 22

Additional Activity 1

Day 4

"Tree-mendous Math" Activity 23

Day 5

"Tree-mendous Graphs" Activity 24

Day 6

"We Must Protect Our Trees" Activity 25

Day 7

"Recycle and Save a Tree" Activity 26

## **Unit 5 Wildlife Conservation**

### **Concepts**

The student will:

- realize the interdependency of the food chain
- identify the components of habitat
- recognize the dependency humans and animals have on habitat
- become aware of the many animals that are extinct or endangered of being extinct
- understand environmental affects on the survival of fish
- decide how he/she can help control and prevent pollution
- recognize signs and symbols designed to protect and conserve our environment

### **Suggested Daily Lesson Plan (Activities 27 - 34)**

Day 1

"The Food Chain" Activity 27

Additional Activity 1

Day 2

"Making a Food Chain" Activity 28

Day 3

"More Food Chains" Activity 29

Day 4

"Habitat Lap Sit" Activity 30

Additional Activity 1

Day 5

"Habitat Rummy" Activity 31

Day 6

"Going, Going, Gone" Activity 32

Additional Activity 1, any of these worksheets to reinforce the learned concept

Day 7

"Pollution Hurts" Activity 33

Day 8

"Signs Can Save" Activity 34

Day 9

"Hatching Egg-Citement" Activity 35

## Activity Guide

This activity guide lists each of 35 activities under the appropriate section of Science/Social Studies, Language Arts, Math or Art. Some activities are listed under more than one section. This guide shows basic skills and the conservation topic found in each activity.

### Science/Social Studies

Activity#	Page#	Skill	Conservation Topic
1	1	comprehension	soil, natural resources
2	13	observation	soil, animals
3	17	observation, infer, record keeping	moisture in soil
4	21	observation, infer	organic matter
5	23	comprehension, observation	soil texture
6	27	observation	soil erosion
7	31	observation, comprehension	soil, roots
8	33	record keeping, observation	water, plants
9	37	infer	plants, needs
10	39	sequencing, record keeping	growing plants
11	43	comprehension	food from plants
12	49	infer	grass communities
13	51	infer	water use
14	65	infer	forms of water
15	69	observation	rain, soil
16	73	observation, comprehension	water cycle
17	85	observation, comprehension	water pollution

**Science/Social Studies (con't)**

<b>Activity#</b>	<b>Page#</b>	<b>Skill</b>	<b>Conservation Topic</b>
18	93	observation, analysis	succession
19	97	infer	succession
20	101	record keeping, observation	trees
21	109	comprehension	tree uses
22	115	comprehension	leaves and nature
23	117	identification	Nebraska trees
24	121	identification	Nebraska trees
26	135	infer, awareness	recycle
27	155	infer, observation	food chain
28	161	comprehension	food chain
29	165	comprehension	food chain
30	169	infer, generalization	habitat
31	179	comparison, application	habitat
32	183	comprehension	endangered animals
33	199	infer	pollution wildlife, environmental
35	219	infer	affects

**Language Arts**

1	1	reference material use	natural resources, soil
8	33	alphabetical order	water, plants

**Language Arts (con't)**

Activity#	Page#	Skill	Conservation Topic
10	39	following directions	growing plants
13	51	sentence completion	water use
19	97	verbal communication	succession
20	101	description	trees
21	109	comprehension	tree uses
25	129	synonyms, homonyms	forest fires
31	179	reference material use	habitat
32	183	reference material use	endangered animals
34	215	reading symbols	signs, safety

**Math**

8	33	hours, minutes	water, plants
13	51	word problems	water use
14	65	temperature	forms of water
23	117	multiplication +, -, division	Nebraska trees
24	121	bar graph	Nebraska trees
26	135	weight	recycle
32	183	addition, subtraction	endangered animals
33	199	story problems	pollution
35	219	addition, subtraction	environmental affects, wildlife

**Art**

<b>Activity#</b>	<b>Page#</b>	<b>Skill</b>	<b>Conservation Topic</b>
12	49	mural	grass communities
19	97	drawing	succession
22	115	plaster of paris prints	leaves and nature
25	129	design, ads	forest fires
33	199	creativity, characters	pollution
34	215	design, symbols	signs, safety

## Worksheet Guide

This worksheet guide lists each worksheet under page number and activity number. For example, the first worksheet listed in Science is page 7, Activity 1. You can then discover the skill used and conservation topic covered on this worksheet by going across the page. Science, Language Arts and Math are the subjects used in this guide.

### Science

Page #	Activity #	Skill	Conservation Topic
7	1	classification	natural resources
11	1	classification	renewable resources
12	1	generalization	natural resources
19	3	record keeping	soil types, moisture
36	8	record keeping	plant parts, water
41	10	sequencing	growing plants
42	10	measurement	growing plants
47	11	sequencing	food from plants
61	13	comprehension	natural resources, power
67	14	sentence completion	forms of water
71	15	vocabulary	water bodies
79	16	diagrams, labeling	water cycle
80	16	comprehension	water cycle
81	16	reading diagrams	water cycle
89	17	comprehension	water pollution
95	18	classification, sequencing	succession
113	21	infer	tree uses

**Science (con't)**

Page#	Activity #	Skill	Conservation Topic
127	24	comprehension	tree, age
132	25	comprehension	forest fires
142	26	record keeping	recycling
147	9	comprehension	recycling
154	26	puzzle	recycling
160	27	crossword puzzle	food chain
162	28	infer	food chains
163	28	infer	food chains
164	28	infer	food chains
172	30	classification	habitat
177	30	following directions	adaptation
190	32	identification	endangered animals
197	32	comprehension	endangered animals
202	33	sequencing	pollution
210	33	classification	pollution
211	33	classification	environment
220	35	limiting factors	environment

**Math**

5	1	number sequence, 1-60	natural resources
6	1	number sentences, addition	natural resources

**Math (con't)**

Page #	Activity #	Skill	Conservation Topic
36	8	minutes, hours	plant parts, water
54	13	multiplication, division	water use
55	13	story problem	water use
57	13	measurement, quart, gallon	water use
59	13	multiplication, word problems	water use
60	13	number patterns	natural resource
67	14	temperature	forms of water
108	20	subtraction, 2 places	Trees Nebraska
114	21	numerical order (2 pages)	natural resources
119	23	story problems	Nebraska trees
120	23	story problems	Nebraska trees
144	26	calendar, dates	recycling
145	26	money equivalents	recycling
149	26	multiplication, word problems	recycling
152	26	even numbers	recycling
173	30	word problems	habitat
174	30	subtraction, word problems	habitat
186	32	expanded notation	endangered animals
188	32	+, -, 3 and 4 digits	endangered animals
194	32	names for number	endangered animals
195	32	ordinal numbers	endangered animals

**Math (con't)**

<b>Page #</b>	<b>Activity #</b>	<b>Skill</b>	<b>Conservation Topic</b>
196	32	roman numerals	endangered animals
203	33	word problems	pollution
205	33	addition, under 18	pollution
207	33	addition 2 places	pollution
208	33	multiplication word problems,	pollution

**Language Arts**

4	1	reference material use	natural resources
8	1	comprehension	natural resources
9	1	sentence completion	natural resources
10	1	spelling, correction	natural resources
35	8	comprehension, alphabetical order	plant parts, water
55	13	complete sentences	water use
56	13	punctuation	water use
58	13	contractions	water use
62	13	following directions, comprehension, map skills (2 pages)	environment
63	13	following directions, comprehension, map skills (2 pages)	environment
82	16	table of contents	water cycle
83	16	title selection	water

Language Arts (con't)

Page #	Activity #	Skill	Conservation Topic
112	21	comprehension	uses, trees
130	25	homonyms	trees, protection
131	25	synonyms	trees, protection
133	25	comprehension	forest rangers
139	26	comprehension	recycling
140	26	spelling	recycling
141	26	handwriting	recycling
143	26	verb usage	recycling
146	26	comprehension	recycling
148	26	decoding	recycling
150	26	subject, predicate	recycling
151	26	comprehension	recycling
153	26	decoding, picture story	recycling
175	30	abbreviations	habitat
176	30	adjectives	habitat
187	32	cause and effect	endangered animals
189	32	comprehension	endangered animals
191	32	context clues	endangered animals
192	32	alphabetical order	endangered animals
193	32	main idea	endangered animals
204	33	contractions	pollution

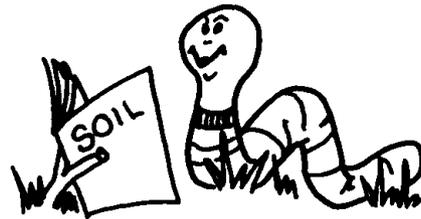
**Language Arts (con't)**

<b>Page #</b>	<b>Activity #</b>	<b>Skill</b>	<b>Conservation Topic</b>
206	33	sequencing	pollution
209	33	compound words	pollution
212	33	comprehension	pollution
213	33	topic sentences	pollution
218	34	symbols	signs, environment

# Activity 1

## Soil Conservation

### We Depend Upon Soils



**Subject Area:** Science, Reading

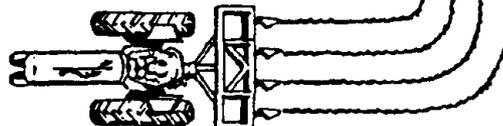
- Objectives:**
1. Students will identify soil as a natural resource common to all consumer products.
  2. Students will use reference materials (i.e. encyclopedias, maps and almanacs) to research the resource materials used to make pizza.

**Suggested Grade Level:** 3-4

**Background:** Every product that we buy, the energy we use; and the foods we eat are directly or indirectly a product of soils. Complicated items such as an automobile, require more resources. Thus, more soils in different locations are involved.

- Materials:**
1. Worksheet 1
  2. Reference Material
  3. Answer Key A

- Procedure:**
1. Divide the students into groups of two or three. Assign one of the following products to each group. (One product can be assigned to more than one group to check each other). (Products: light bulb, telephone, soft drink can, electric power, record album, jeans, automobile, winter jacket).
  2. Using encyclopedias, maps, product labels, and other references, have each group discover which of the following resources are used to make their assigned products. Most items need more than one resource and each resource may be used more than once. (Resources: oil, copper, coal, tungsten, iron, aluminum, wool, rubber, chromium, cotton).
  3. Compare answers when completed. (Refer to Answer Key A). Could either soil or water have been listed as a resource for each item? Why?
  4. Have students complete Worksheet 1 in their groups or individually.
  5. Compare answers together in class. Emphasize that soil and water are the basis to provide us these products. We depend on soil and water.



**Additional  
Activity:**

1. Complete any of Worksheets 2 - 9, to discover more about our natural resources and ways to conserve them.

**Adapted  
From:**

1. Conserving Soil (Activity Master 6)
2. Conservation for Children

## Answer Key A

Item	Resources
Light bulb	iron, copper
Telephone	copper, iron, oil, rubber
Soft Drink Can	aluminum, iron
Electric power	coal, oil
Record album	oil
Jeans	cotton, iron, oil
Automobile	iron, aluminum, copper, chromium, rubber
Winter jacket	wool, cotton, oil, iron

**Where Did Our Pizza Come From?**

Listed below are some of the ingredients of a pizza. You may want to add some of your favorites that are not on the list.

**Look up:**

1. The main resource material of the ingredient.
2. A possible geographic location of the resource material.
3. What processing step(s) are needed to make the ingredient.
4. A possible geographic location of the processing.



Then fill in this chart. The first item has been done as an example.

Ingredient	Resource Material	Location	Processing	Location
Flour	Wheat	Nebraska	Cleaning Milling	Omaha
Salt				
Spices				
Tomato				
Sauce				
Sausage				
Hamburger				
Cheese				
Your Favorites:	_____			
	_____			
	_____			

The ingredients came from many different locations and were processed in many other locations. What basic natural resources are common to the pizza ingredients?

\_\_\_\_\_

**Directions:** Fill in the missing numbers

1	2	3	N	5	6	7	8	9	10
A	12	13	14	15	S	17	18	19	20
21	R	23	24	25	26	27	28	29	D
31	32	33	34	35	36	O	38	39	40
W	42	43	44	I	46	47	48	T	E
51	52	53	54	55	56	57	L	59	60

Answer the question below by filling in the spaces. Use the letters in the boxes that match the numbers under each space.

**What are three of our natural resources?**

16 37 45 58

11 45 22

11 4 30

41 11 49 50 22



**Directions:** Circle the correct number that completes the math problem. Write the letter that is under the correct number on the blank spaces.

$4 + 5 = \underline{\quad}$

8    9    7  
P    S    T

$3 + \underline{\quad} = 12$

9    4    8  
A    B    O

$\underline{\quad} + 7 = 9$

4    1    2  
W    M    N

$1 + \underline{\quad} = 10$

8    2    9  
L    R    D

Glass is made from \_\_\_\_\_.

$6 + \underline{\quad} = 11$

3    5    4  
B    O    T

$2 + \underline{\quad} = 10$

8    7    9  
I    A    R

$\underline{\quad} + 6 = 9$

2    4    3  
T    O    L

Plastic is made from \_\_\_\_\_.

$8 + \underline{\quad} = 15$

9    2    7  
P    X    W

$\underline{\quad} + 4 = 10$

3    6    1  
G    O    L

$\underline{\quad} + 2 = 9$

7    4    6  
O    R    J

$3 + 3 = \underline{\quad}$

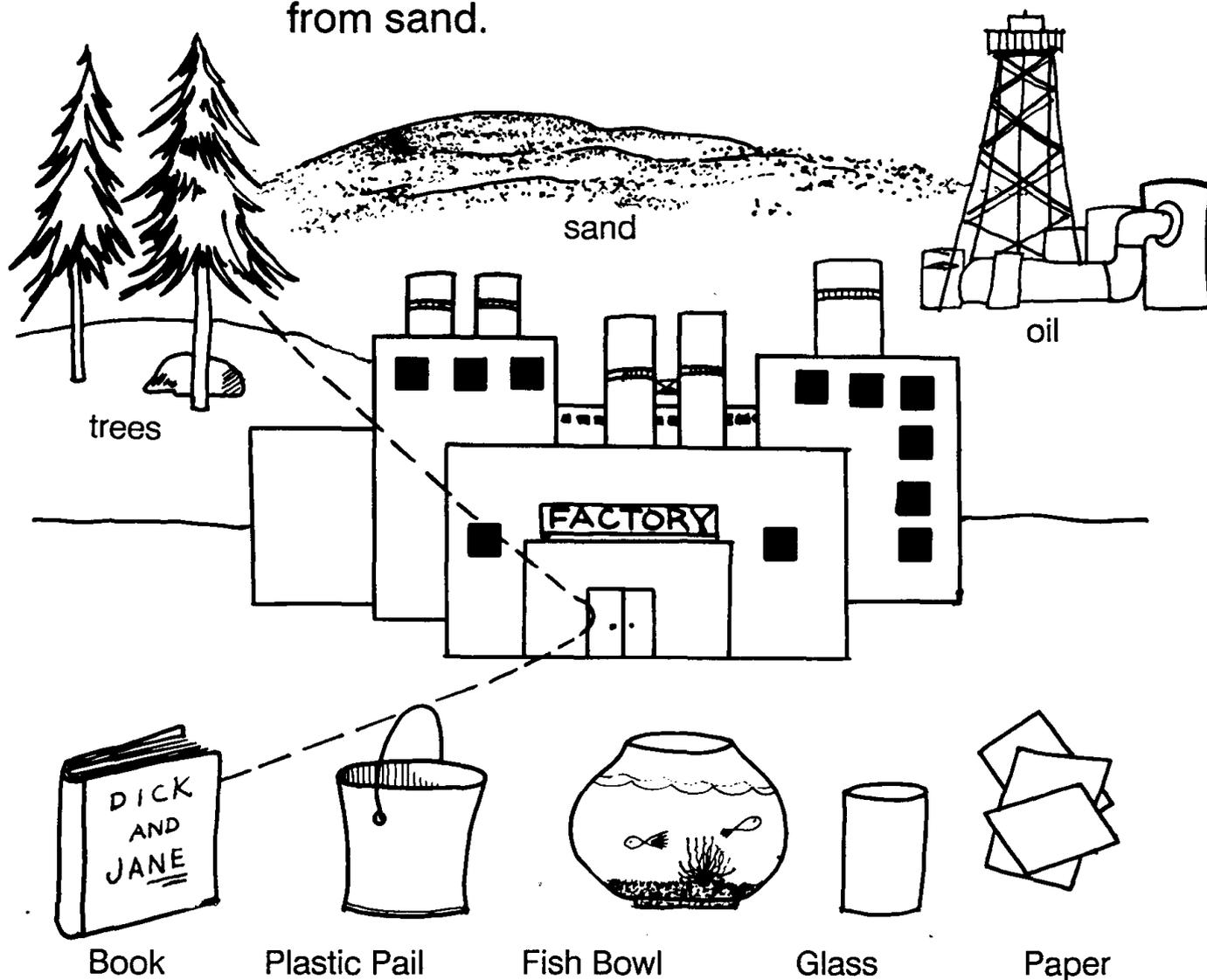
2    5    6  
A    S    D

Paper is made from \_\_\_\_\_.

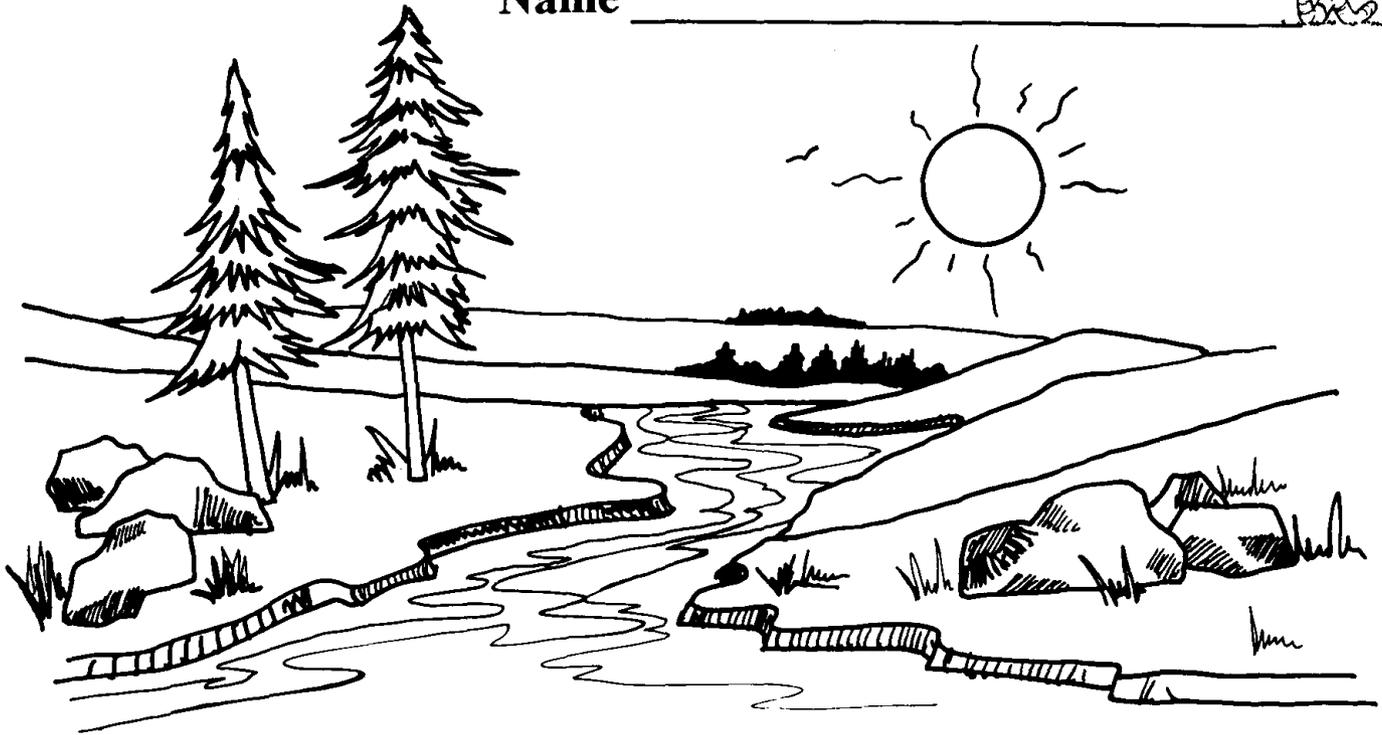


We get many things from our natural resources. Some of these things are made in factories.

**Directions:** Draw a line from the things we use back to the natural resource that it comes from. Be sure to go through the factory. Use a black crayon if the object is made from oil. Use a green crayon if the object is made from wood. Use an orange crayon if the object is made from sand.



Name \_\_\_\_\_



## Natural Resources

Natural resources are things we get from nature. Water is a natural resource. The sun is another natural resource. Trees and minerals are natural resources, too.

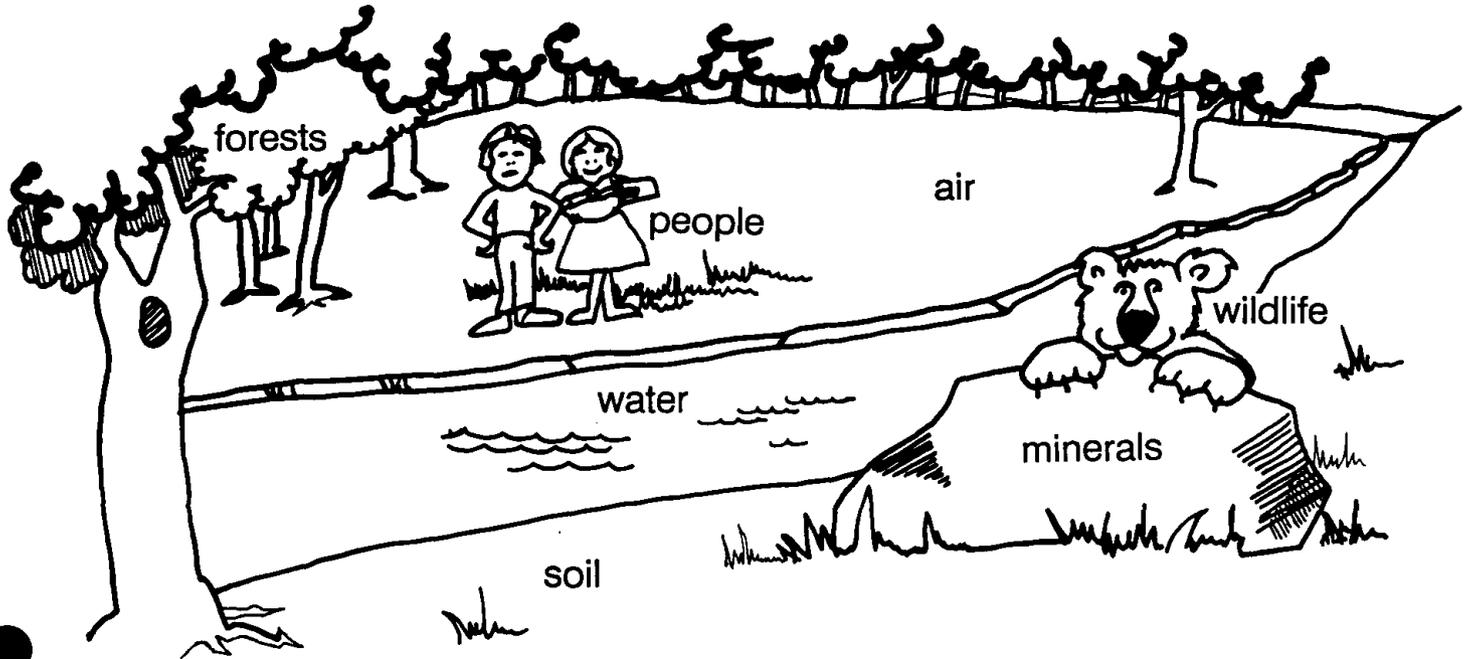
We use our natural resources to make the many things we use everyday. They also can provide us with energy and power.

Write "yes" or "no" after each question.

1. Is a river a natural resource? \_\_\_\_\_
2. Is sunlight a natural resource? \_\_\_\_\_
3. Is a plastic cup a natural resource? \_\_\_\_\_
4. Is wood a natural resource? \_\_\_\_\_
5. Is a book a natural resource? \_\_\_\_\_
6. Is gold a natural resource? \_\_\_\_\_



Here are seven of our natural resources. Write the name of the correct natural resource in the blank space in each sentence below.



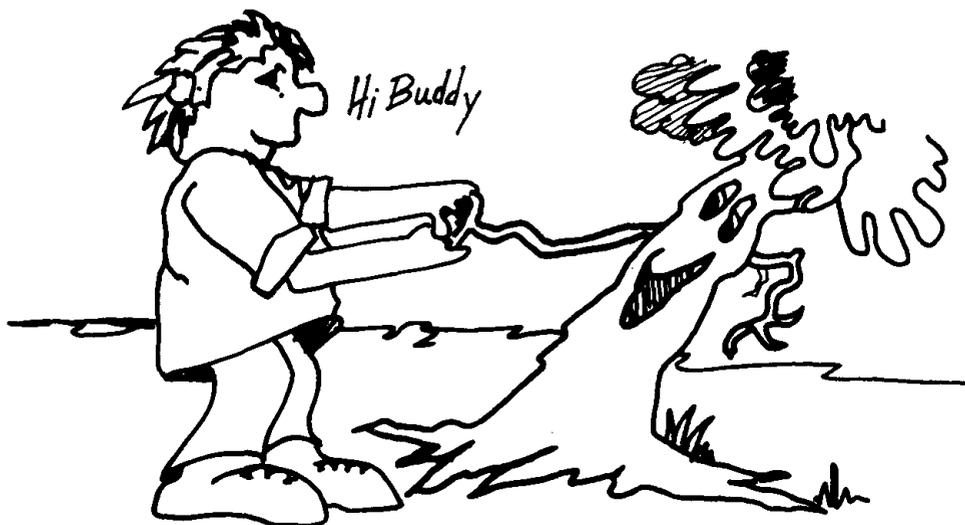
1. We need \_\_\_\_\_ to drink, to bathe in and to wash clothes in.
2. Plants, animals and people need \_\_\_\_\_ to breathe.
3. We need \_\_\_\_\_ to grow plants in.
4. Salt, chalk and silver are some of the \_\_\_\_\_ we use.
5. \_\_\_\_\_ need to use natural resources wisely and to save or conserve them for the future.
6. We use our \_\_\_\_\_ for wood to build houses and furniture.
7. Rabbits, bears and deer are part of our \_\_\_\_\_.

Name \_\_\_\_\_



**Directions:** A word in each sentence is all mixed up. Unscramble the letters and write the word correctly on the blank space.

1. Most paper is made from doow. \_\_\_\_\_
2. The pages of your book were once a eret. \_\_\_\_\_
3. Nasd is used to make glass. \_\_\_\_\_
4. Plastic is made from iol. \_\_\_\_\_
5. Minerals give us many matles. \_\_\_\_\_
6. We need to vesa our natural resources. \_\_\_\_\_
7. We should be careful not to teaws them. \_\_\_\_\_





## Renewable Resources

Years ago there were not as many people as there are today. People did not worry about running out of things. If some trees were cut down for wood or fuel, others began to grow. If some animals were killed for food, others were born. Things that were used were replaced by new living things. For this reason plants and animals are called 'renewable resources.'

Air is also a renewable resource. Plants and animals recycle the air. The plants give off oxygen which is the part of the air that animals need to breath. Animals, in turn, give off carbon dioxide that plants need.

Another renewable resource is soil. But it takes a long, long time for decaying plants and animals to become soil. We need to take care of the soil.

Nonrenewable resources are things which cannot be replaced. Once they are used they are gone forever. There is a limited amount of these materials on the earth.

Ores, from which metals are made, and minerals that come from the rocks and earth are nonrenewable resources. Fossil fuels, coal, oil and natural gas are also nonrenewable resources. When we use up what there is, there will be no more.



**Directions:** On the space in front of each item below, put a '1' if it is made from a renewable resource, if the item is made from a nonrenewable resource put a '2'.

\_\_\_\_ rollerskates

\_\_\_\_ paper

\_\_\_\_ zippers

\_\_\_\_ lumber

\_\_\_\_ Television sets

\_\_\_\_ fishing reels

\_\_\_\_ knives, forks and spoons

\_\_\_\_ wool shirts

\_\_\_\_ cardboard

\_\_\_\_ cars

\_\_\_\_ plastic pots

\_\_\_\_ stoves

\_\_\_\_ movie film

\_\_\_\_ alarm clocks

\_\_\_\_ glasses

\_\_\_\_ breakfast cereals

\_\_\_\_ frisbees

\_\_\_\_ bicycles





Here are some ways you can help to save our natural resources

**Directions:** Write **yes** in front of the ways that will help.  
Write **no** in front of the ways that will not help.



### Ways to Save Our Natural Resources

- \_\_\_\_\_ Use both sides of writing papers.
- \_\_\_\_\_ Always use paper cups and plates.
- \_\_\_\_\_ Turn off lights you are not using.
- \_\_\_\_\_ Throw books away after you have read them.
- \_\_\_\_\_ Turn off water you are not using.
- \_\_\_\_\_ Recycle as many things as you can.

## Activity 2

### Soil Conservation

# What's Living in the Soil



**Subject Area:** Science

- Objectives:**
1. The students will realize there are living organisms in the soil.
  2. The students will observe the kinds of living organisms in the soil.

**Suggested  
Grade Level:** 3-4

**Background:** The soil is full of life. Many animals, such as moles, badgers, and prairie dogs use the soil to find food and shelter. Earthworms and many insects also live in the soil. As these animals burrow and tunnel, they mix the soil, allowing air and water to penetrate beneath the ground's surface. Plant roots stretch down through the soil where they can absorb the air, water, and nutrients needed for growth.

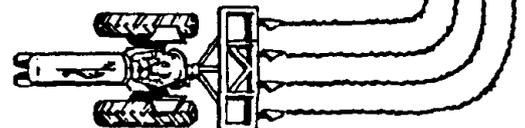


In addition to these plants and animals, billions of microscopic organisms, such as bacteria and algae, inhabit the soil. They, along with fungi, earthworms, and other soil creatures are decomposers. Decomposers help break down dead plant and animal tissue, and other organic material. Nutrients are returned to the soil, where they become available once again to plants.



Soil is made up of four distinguishable elements--air, water, organic materials (living and dead plants and animals), and minerals (parent materials). The average soil's composition is 45 percent minerals, 25 percent water, 25 percent air, and 5 percent organic matter. However, the volume of organic matter generally increases as the moisture content increases. In an arid region, such as the southwestern United States, soils will have a higher percentage of minerals and air, and in a humid region, such as the southeastern United States, soils will have more water and organic materials than the average soil.

In a soil profile, the O horizon is a thin layer of organic matter found generally only in swamps or forests. The A horizon or the topsoil is the zone of removal. It is usually darker than other layers due to the accumulation of organic matter. This horizon is the top layer in fields; it is the cultivated land. Water leaches out clays, salts and lime. The B horizon or the subsoil is the zone of accumulation. It is usually lighter in color than the A horizon. The B horizon accumulates limes, salts, and clay. The C horizon or the parent material is the zone of transition. This is where loose parent material partially disinte-



grated is found. Only limited weathering of parent material occurs as it is insulated by the A and B horizons. Depth of each horizon can vary greatly in different types of soil.

**Materials:**

1. Transparencies (enclosed)
2. Ruler
3. Small spade
4. Six or more small bottles w/ lids or corks (baby food jars would work)
5. Magnifying glass or hand lens
6. Microscope
7. Microscope slides and cover slips

**Procedure:**

\* This activity is best done in the spring.

1. Ask students "what's in the soil?" Let them brainstorm many things. (decaying plants, animals, worms, insects, air, water, roots, microscopic organisms, nutrients....)

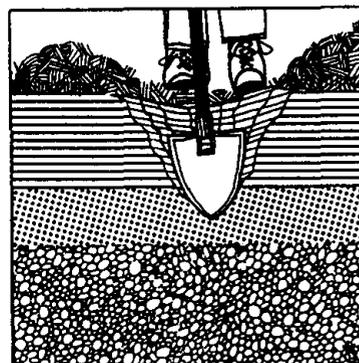


2. Put worksheet 1 on the overhead or pass out copies to each student, and discuss:

- What evidence of plant life do you see in this soil profile? (dandelion, grass, leaves, acorn, algae)
- What animals live here? (earth-worm, snail, centipede, spider, crickets, daddy-long-legs, shrew, grubs, ants, nematode, bacteria, mole)
- Can you see the different soil layers? (difference in color)
- Show worksheet 2
- Do some plants extend their roots into the subsoil layer? (yes)
- Discuss the different horizons using the background information.

3. Together with students, (if not possible to involve students, bring these samples into the classroom) in a one foot square, digging two or three inches deep, collect soil from the following places: (1) wooded area, (2) an undisturbed grassy area or weed patch in a vacant lot and (3) an eroded area or excavation site with exposed subsoil. As you remove the soil, look for burrows of worms and other life and also for eggs from insects. Place each sample on a large white sheet of paper. Carefully sort out each soil sample watching closely for living things. Place the different kinds of animal life in separate bottles. Count the animal life belonging to such groups as:

- Worms
- Grubs and Larvae
- Snails and Slugs
- Insects - 3 pairs of legs



- Spiders, Mites, Ticks or Other Animals
- Animals with more than 4 pairs of legs

Which soil sample has the most animal life?

No matter how large the total number of visible animals, it is small compared to the number of microscopic plants and animals, particularly bacteria and fungi present. The soil is the home of many kinds of plant and animal life, most of which are too small to see with the naked eye.

4. Using a microscope slide place a tiny bit of soil on it and then add a drop of water. Place a cover slip over the slide and look at it under the microscope. Students should look for moving life. Perhaps bacteria, fungi, and algae. It is not necessary to know what is seen, but to realize there are many living things in the soil that can't be seen with the naked eye.
5. After looking at soil with the naked eye and under a microscope you can see how many living things are present. Think now of a hard rain washing a lot soil from a farmers field. Think of all the living things that too would be washed away. It is important to protect the soil. Who is concerned with soil?

**Additional  
Activity:**

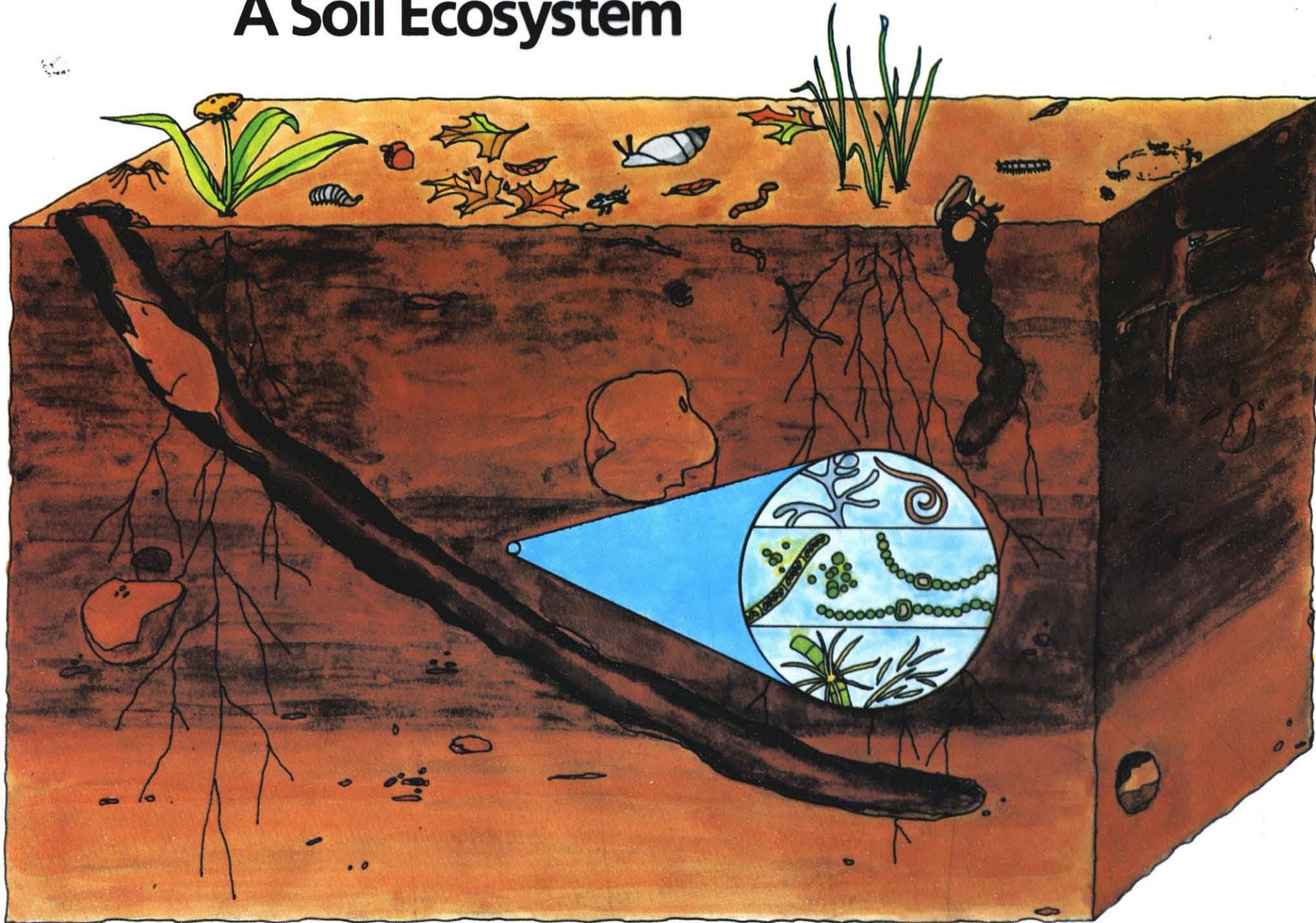
1. Create a soil mural by projecting the transparency onto a large sheet of white paper, using an overhead projector. Trace the image and add other plants and animals that live in the soil.

**Adapted  
From:**

1. Conserving Soil

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# A Soil Ecosystem



# A Soil Ecosystem Transparency

## Background Information

The soil beneath our feet is full of life. Many animals, such as moles, badgers, and prairie dogs use the soil to find food and shelter. Earthworms and many insects also live in the soil. As these animals burrow and tunnel, they mix the soil, allowing air and water to penetrate beneath the ground's surface. Plant roots stretch down through the soil where they can absorb the air, water, and nutrients needed for growth.

In addition to these plants and animals, billions of microscopic organisms, such as bacteria and algae, inhabit the soil. They, along with fungi, earthworms, and other soil creatures play an important role in the decomposition of organic material. Decomposers help break down dead plant and animal tissue. Nutrients are returned to the soil, where they become available once again to plants.

The next time you stand on the soil, think about the billions of organisms at work beneath you. They are part of a cycle that returns valuable nutrients to the soil. Without these unseen creatures, the plants we depend on for food could not grow, and the life-sustaining cycle on earth would be broken.

## About the Transparency

The transparency illustrates a cross-section of hypothetical soil. The top portion of the circular enlargement is about 50X normal size; the center, about 150X; and the bottom about 300X.

**Transparency Use:** Write on it with a grease marker. Remove markings with a dry towel. Permanent-ink and water-soluble transparency marker writing cannot be removed without damage to the emulsion.

## Activities

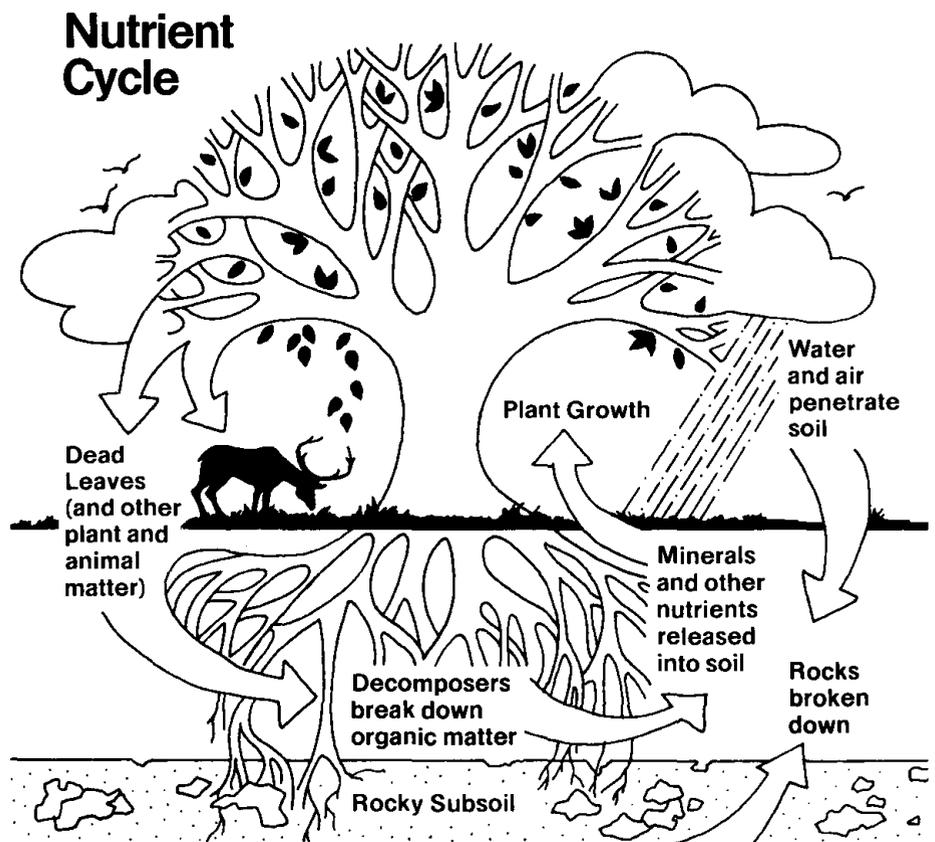
★ Use the transparency to introduce the topic of soil.

- What evidence of plant life do you see in this soil profile? (dandelion, grass, leaves, acorn, algae)
- What animals live here? (earthworm, snail, centipede, spider, cricket, daddy-longlegs, shrew, grub, ants, nematode, bacteria)
- What role do these plants and animals play in the ecosystem? How do they use the soil? How do they contribute to the nutrient cycle? Can you see different soil layers? Do some plants extend their roots into the subsoil layer?

★ Collect soil samples from different areas. Working in

groups, have your students examine the soil samples using a white tray or sheet of paper, a bright light, forceps, and a magnifier. What different plants and animals can they find? Can they identify them using resources from your library? Find out what role these plants and animals play in the soil ecosystem.

- ★ Create a soil mural by projecting the transparency onto a large sheet of white paper, using an overhead projector. Trace the image and add other plants and animals that live in the soil.



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# A Soil Profile

Horizons

0"

**O**

2"

**A**

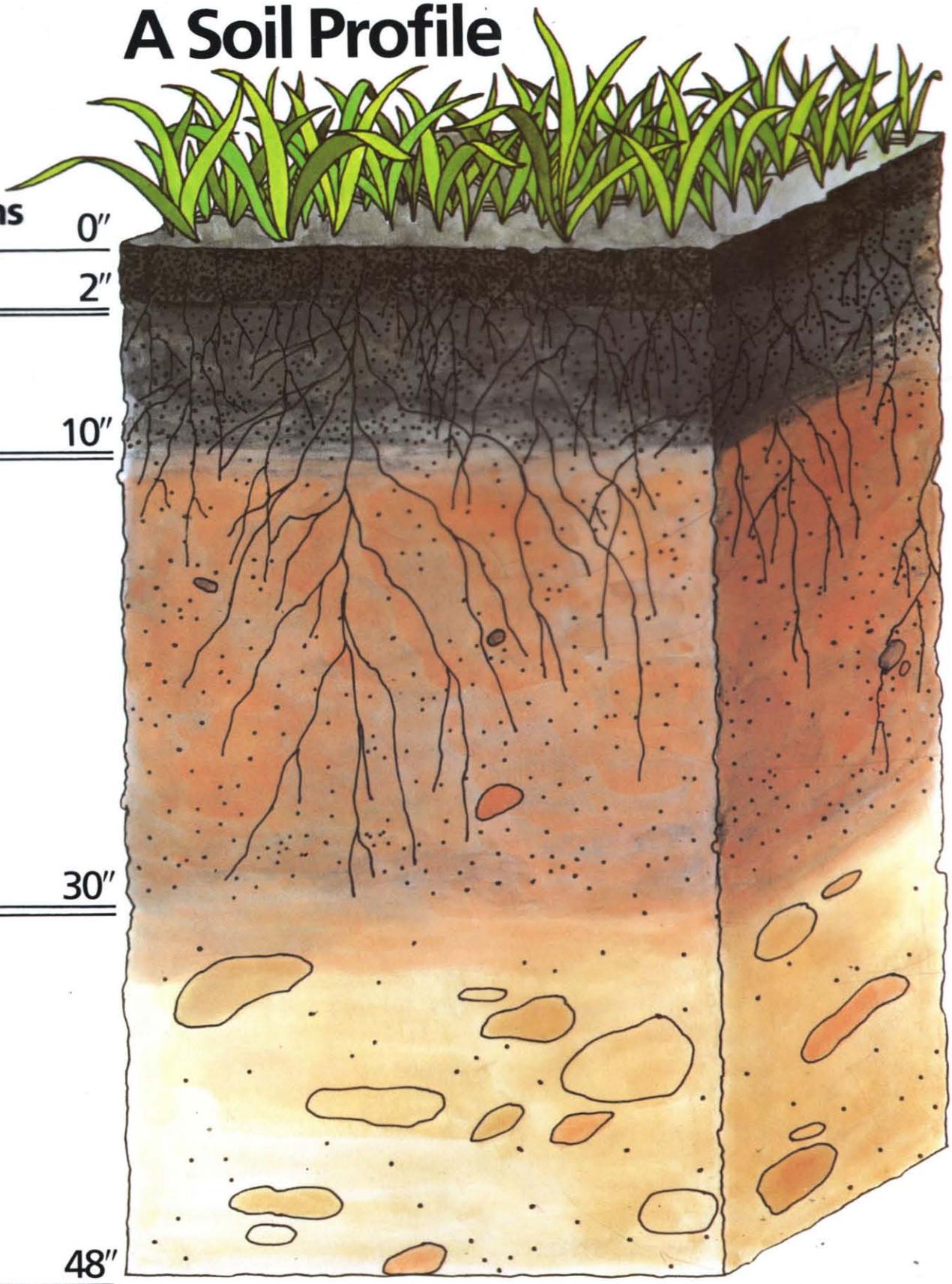
10"

**B**

30"

**C**

48"



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# A Soil Profile Transparency

## Background Information

A soil profile is a slice of earth several feet deep. It shows layers of soil — some less than an inch thick, some over 2 feet thick.

By studying soil profiles, scientists learn about the soil, its characteristics, and how to use and protect it.

Sand, silt, and clay are the various sized particles that make up soils. The texture of a soil is determined by the relative amounts of these particles in the soil. For example, a sandy clay soil may contain about 50 percent clay, 45 percent sand, and 5 percent silt. Loam soils contain about equal amounts of all three.

Some soils were formed by the breaking down and weathering of rock. Others were formed from materials transported and deposited by water, wind, or glaciers. Deep soil layers and rock change very slowly.

It takes 100 to 600 years, or more, to form an inch of topsoil. Wind and water erosion can remove that much topsoil in a single year. When a soil erodes excessively, the exposed subsoil is more difficult to cultivate and less productive for plant growth.

It is NSTA's position that metric measurements should be used in the science classroom at all times. Use the following equivalencies for the English measurements used in the transparency and its accompanying text. For the transparency: 2"  $\approx$  5 cm, 10"  $\approx$  25 cm, 30"  $\approx$  76 cm, 48"  $\approx$  1.22 m. For the text: 1"  $\approx$  2.5 cm, 2'  $\approx$  58.5 cm.

## About the Transparency

Most soil profiles have a surface layer of organic material and two or three layers of mineral materials. These are the horizons of a typical soil profile.

If present as organic material, the O horizon at the top is usually less than an inch thick. The dead plant and animal materials decompose into nutrients that enrich the soils.

Topsoil, the A horizon, is the upper soil layer. Plant roots, bacteria, fungi, and small animals are abundant. Plants thrive in it. It has more organic matter and is darker than the subsoil.

Subsoil, the B horizon, is the middle soil layer. It has fewer organisms and less topsoil. Plants don't grow as well in it. If subsoils are clayey, they usually are harder when dry and stickier when wet than the surrounding soil layers.

The C horizon is the lowest layer. It is less altered and weathered than the layers above and has less living matter. It may be called the parent material. It gets this name because it is the weathered rock and partly weathered soil from which the soil layers above were formed.

**Transparency Use: Write on it with a grease marker. Remove markings with a dry towel. Permanent-ink and water-soluble transparency marker writing cannot be removed without damage to the emulsion.**

## Activities

**★Use the transparency to introduce the topic of a soil profile.**

...What differences are there in the horizons? (depth, color, plant growth, soil particle or rock size)

...Why is the particle size important to plant growth and the water-holding capacity of soil? (more total surface area on small particles, better aeration/water flow through mixed soil sizes)

...What results if plant cover is absent? (soil erosion/lost fertility)

**★Locate different soil profiles in streambanks, roadside cuts, and building-site excavations.** Have students point out color, texture, and appearance changes in the horizon, measure horizon depths, sketch the profiles studied.

**★Fill a fruit jar 2/3 full of water, add soil to nearly fill it; shake vigorously.** Let soil fully settle. Have students hold paper beside the jar, draw the different layers, and label each as clay, silt, sand, or rocks.

**★Collect samples of sand, silt, and clay from various sites.** Have students examine and describe each sample. Identify soil textures (most examples will be mixtures).

**★Show how soil is created.**

...By abrasion: Rub together limestone, sandstone, brick, or concrete.

...By heating: Fully heat limestone and drop it in ice water; it should crack or break.

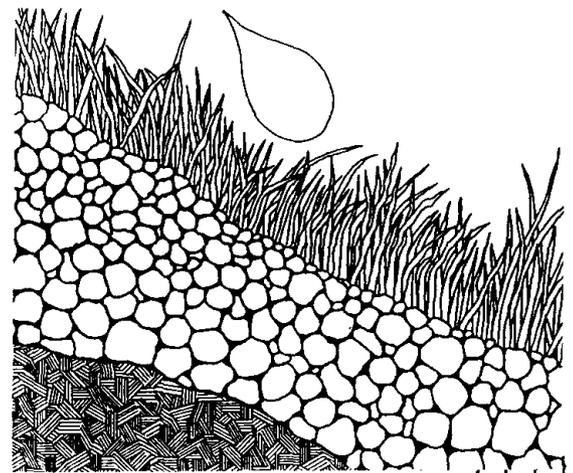
...By freezing: Freeze water in a glass jar; what happens to the jar? Water trapped in rock freezes and rocks break into smaller and smaller pieces.



### Activity 3

## Soil Conservation

# Moisture in Soil



**Subject Area:** Science

**Objective:** 1. The students will realize the varying water holding and drainage capacities of different soils and the importance of this to plants.

**Suggested  
Grade Level:** 3-4

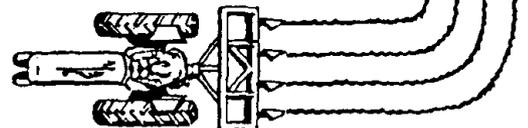
**Background:** Rate of water movement through the soil is important. If water moves through soil too fast, it drains away before plants can use it. On the other hand, if seepage is too slow, water will run off before it has time to soak into the soil, thus leaving plants without any water again. Although many factors are taken into consideration, soil seepage time is usually determined by soil texture (the size of soil particles) Soil requires both water and oxygen to support strong plant growth. The ideal soil is a combination of sand, silt and clay. Sand provides fast drainage and good aeration, but does not hold water very well. Clay is good for its water holding ability, but dangerously low in supplying air to the soil. As water fills the spaces between soil particles it drives out air. In soils with a high proportion of clay, water remains a long time in the pore spaces and the roots are deprived of oxygen for many hours. With some plants this temporary lack of oxygen is very damaging. Thus it is easy to drown plants in a clay soil.

**Materials:**

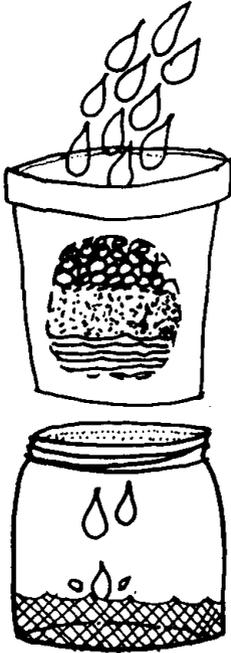
1. Clay soil sample, sand soil sample, and loam soil sample (Available from local NRD, SCS office, extension agent or Vo Ag teacher).
2. Newspaper
3. Three clear plastic cups with holes in bottom (use a hot nail)
4. Three baby food jars
5. Worksheet 1
6. Thin nail
7. Hammer
8. Water
9. Measuring cup
10. Paper towels

**Procedure:**

1. Spread each sample of soil (clay, sand, loam) separately on a newspaper and leave them until all feel dry to the touch. Two or three days should



be long enough if you stir the soil occasionally. Sift the soil samples to be used in class.



2. With a hot nail, punch five holes in the bottom of each plastic cup.
3. Cut a circle of paper towel to fit the bottom to each cup. Put these inside the cans to keep the soil from dropping through the holes.
4. Fill each cup one-third full. Pack clay soil in one, sandy soil in the second, and loam soil in the third.
5. Place the cups on the baby food jars.
6. Using a measuring cup, pour one-fourth cup of water on the soil in each can. Record the information on the chart found on Worksheet 1.
7. Discuss the permeability results with the children. Which soil did the water enter most quickly? Through which soil did water pass most rapidly? Most slowly? Which soil let the most water through? Which soil held the most water? What do you think would happen to plants growing in each soil in a very dry summer? In a wet summer? Which soils would you plant a seed in? Why? Which sample would you not plant a seed in? Why? Which soil would you not want your plant to be in during a drought?

**Additional  
Activities:**

1. Use a variety of surfaces to test its capability of absorbing water and compare to the soil experiment.  
Sprinkle water on:
  - a. sponge
  - b. piece of wood
  - c. cloth
  - d. plastic
  - e. paper
  - f. soil

**Adapted  
From:**

1. Teaching Soil and Water Conservation  
USDA Soil Conservation Service
2. Minnesota's Ag - Stravaganza



Name \_\_\_\_\_

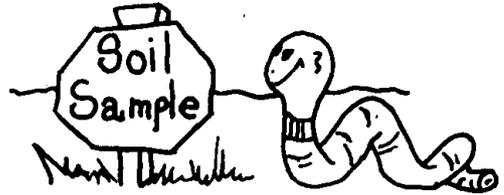


Record how the water enters different soils.

	Clay Soil	Sandy Soil	Loam Soil
Seconds before the water begins to drip.			
Seconds before the water stops dripping.			
Quantity of water that came through			

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## Activity 4 Soil Conservation Organic Matter



**Subject Area:** Science

**Objective:** 1. The students will recognize the importance of organic matter in soil by comparing soil containing organic matter to soil not containing organic matter.

**Suggested  
Grade Level:** 3-4

**Background:** The physical condition of the soil is called tilth. Tilth is due largely to the proportion of sand, silt, clay, organic matter, and past cultivation practices. Tilth can also be influenced by types of soil, moisture of soil when it is worked, and the rate of rainfall. Organic matter is a very important factor for several reasons.

Organic matter adds brown and black color to the soil. A dark soil absorbs more sunlight than a light soil, thus it will warm up faster in the spring than a light colored soil. A plant seed will get off to a faster and a healthier start in warm soil. Organic matter in some types of soils, allows the water to soak in faster than if the soil had no organic matter. This allows more water to reach the growing plant roots and also reduces erosion of the soil by water that runs off because it can't soak in the soil as fast as it is raining. Organic matter also helps supply food to the growing plant.

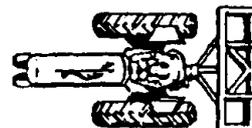
Lack of organic matter can, in some types of soils, lead to compaction (a packing of the soil), which doesn't allow air to circulate, or water to enter into the soil. Plants need air and water to grow. Compaction makes it hard for a plant to develop.

**Materials:**

1. Sawdust
2. Clay soil
3. Paper plates
4. Water

**Procedure:**

1. Collect a sampling of clay soil and a sampling of sawdust
2. Label a paper plate "sawdust" and another "no sawdust."



3. Moisten 1 cup of soil until it will make a mud cake. (If the soil does not hold together, find a soil with more clay.)
4. Place the mud cake on the plate labeled "no sawdust."
5. Moisten and mix thoroughly 1/2 cup of soil and 1/4 cup of sawdust until they make a mud cake.
6. Place the mud cake on the plate labeled "sawdust."
7. Place both plates in the sun and let the mud cakes dry.
8. Record your observation when they are completely dry. Break the mud cakes with your hands. Which cake crumbled easier? (sawdust) How would you explain this? (The soil has organic matter in it.) Compare this experiment to the ground. Some soil gets really hard where other soil doesn't.
9. Record your observations. Discuss with children how you could improve the physical condition of soil. [You could put a mulch pile in the backyard (grass clippings, leaves, produce skins, rinds, and fertilizer). Then in the fall dig this mulch into the garden to sit all winter. In the spring the soil will be richer with organic material. Farmers can leave the crop remains in the field all winter. This will help prevent erosion while helping the soil.]
10. Which soil has the best tilth? (sawdust)

**Additional  
Activity:**

1. Make comparison from our activity between soil from a plowed field and soil from an adjacent fence row that has been in grass for several years. Also, compare the soil on the bare school play yard with the soil along a fence or wall that is covered with grass. Record your observations.

**Adapted  
From:**

1. Soils, Unit IIB  
4-H Members Manual

## Activity 5 Soil Conservation Soil Texture



**Subject Area:** Science

**Objective:** 1. The student will understand that soils are made up of different textures by observing how the soil settles into different layers.

**Suggested  
Grade Level:** 3-4

**Background:** Soil particles vary greatly in size. The largest particles settle to the bottom first. The fine particles settle slowly; some, in fact, are suspended indefinitely.

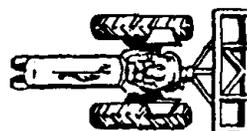
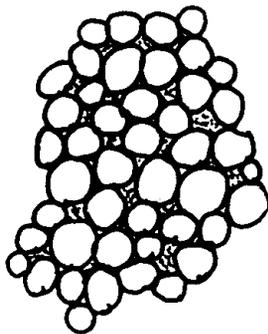
Soil scientists classify soil particles into sand, silt, and clay. Starting with the finest, clay particles are smaller than 0.002 millimeters in diameter. Some are so small that ordinary microscopes do not show them. Silt particles are from 0.002 to 0.05 millimeters in diameter. Sand ranges from 0.05 to 2.0 millimeters. Particles larger than 2.0 millimeters are called gravel or stones.

Size of soil particles is important. The amount of open space between the particles has a lot to do with how easily water moves through a soil and how much water it will hold.

Size of soil particles is important for other reasons, too. It affects the ease of working the soil, what crops can be grown, and the efficiency of certain fertilizers.

Most soils as found in nature, contain a mixture of sand, silt, and clay in different proportions. The proportion of sand, clay, and silt determines quality.

Gardeners describe soil types in many ways-- heavy, light, sandy, clay, loam, rich loam, etc. Scientists and horticulturists classify soil types by the proportion of sand, silt, and clay particles they contain. Sand, silt, and clay are designations based on the sizes of mineral particles. The texture of the soil is determined by the blend of these various sized particles. Classifying the soils in our garden will give us some indication of the problems we are likely to encounter in working with them-- Soil that has too much clay is hard to work and soil that has too much sand dries out fast. Farmers use this information for their fields.



**Materials:**

1. Four Quart jars
2. Soil samples of clay, silt and sand, from your SCS agent, County Extension Agent, or Ag Advisor.
3. Paper plates
4. Water
5. Alum (purchase in a drugstore)
6. Shovel
7. Paper sacks

**Procedure:**

1. At least 2 days before presenting the activity, fill one jar about one-third full of this soil mixture: 40% sand, 40% silt and 20% clay. Add enough water to fill the jar. Shake the mixture thoroughly and set aside to "settle out."



2. Two days later display on 3 paper plates some sand, silt, and clay. Have students pick up and let each kind of soil sift through their fingers. Feel the texture, the particle size. You may want to use the attached label cards to put in front of each plate. (Activity page 1)
3. Show the students the "settled out" jar of soil. Explain what you did two days ago to make this good soil. Have them look closely at the 3 distinct layers. Name the layers.
4. Split the students into several groups (they are going to get soil samples from a garden, wooded area, under the playground). Have them put a small amount of soil in their sacks and return to the room or have students bring soil from home.
5. Spread the samples out on separate paper plates. Crush any lumps and remove large rocks or trash.
6. For each soil type, fill a quart jar one-quarter full with soil, label, and add water until the jar is three-quarters full. Add one tablespoon of alum, close the lid, and shake hard. Students will see that the mixture separates into layers. The larger particles-coarse sand or rocks-settle to bottom of the jar. The finer particles of silt and clay will form the next layer. The material left floating on top of the water is called organic matter. Organic matter is made up of dead leaves, twigs, stems, and parts of animals and plants. The more organic matter in soil, the richer it is. Most of the heavier sand particles will settle in about 1 minute. Silt particles will settle in about 5 minutes.

The fine clay particles take 48 hours or longer. Leave these labeled jars to settle for 2 days.

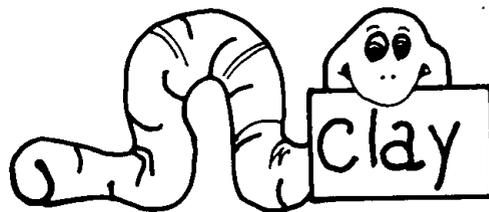
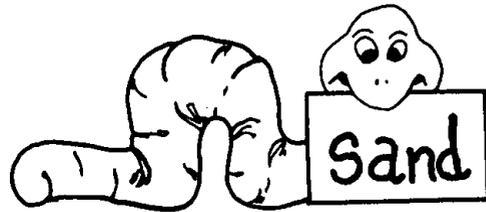
7. After 2 days have the students compare their soil settle to the one you did 4 days ago. Remember 40% sand, 40% silt, and 20% clay is a good kind of soil to have.
8. Then hold a card or heavy piece of paper against the side of the jar and draw a diagram showing the different layers. Label each layer (clay, silt, sand). Compare the diagrams from each jar.
9. Ask the following questions:
  1. Which particles settled first? (sand)
  2. How many layers were there?
  3. Is there a distinct division of layers?
  4. Why did clay take so long to settle? (it is so fine)
  5. Using a magnifying lens which layer is the coarsest? Which is the most compact?
  6. How long did the settling take?
  7. Which sample has the most organic matter?
  8. Which might be best to grow plants in?

**Additional  
Activity:**

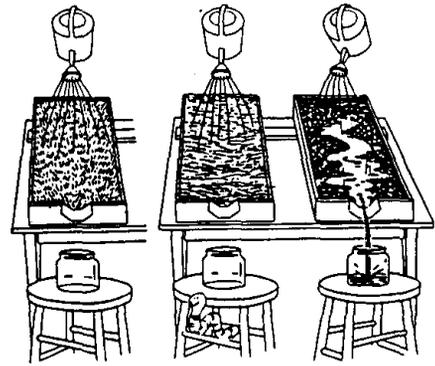
1. Take some dry sandy soil and an electric fan. Turn on the fan. Pour the sand out of a bucket so it will fall in front of the fan. See how the wind sorts soil grains on the basis of size. The light ones will be blown away; the heavier ones will fall to the ground.

**Adapted  
From:**

1. The Growing Classroom
2. Soil We Can't Grow Without It
3. Soil Conservation Topics Education Kit
4. Soil -- Use and Improvement



## Activity 6 Soil Conservation Soil Loss



**Subject Area:** Science

**Objective:** 1. The students will observe how soil conservation methods help prevent water erosion by conducting experiments.

**Suggested  
Grade Level:** 3-4

**Background:** Erosion caused by water has many factors: bare soil will cause water to runoff faster, taking soil with it. Mulch on soil will cause water to runoff more slowly and it will not be as muddy. Water takes longer to flow on soil with sod or grass. Yet, it will continue longer.

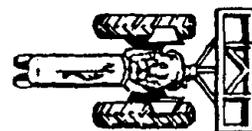
**Materials:**

1. Three wood, cardboard, or plastic boxes about 4" deep (approx. 12" X 20")
2. Enough soil to fill all 3 boxes
3. Three containers to catch water runoff
4. Grass clippings
5. 12" X 20" piece of grass sod (trimmed to 1" thick)
6. Tin, cardboard, or foil to make 'V' spout
7. Sprinkling can

**Procedure:** 1. Cut a 1" deep 'V' notch in the end of each box and then line each with a garbage bag. You may want to make a spout for the notch from foil.



2. **Box 1** - fill it 2" from top with soil and lay the sod on soil.  
**Box 2** - fill it 1" from the top with soil and generously cover the soil with grass clippings.  
**Box 3** - fill it 1" from the top with soil and leave it bare.
3. Prop one end of each box about 4" above the table. Hang the lower edge of each box off the edge of the table.
4. Place a container below each box to catch the water run-off.
5. Fill the sprinkling can with water and pour an equal amount of water on each box at the same rate.



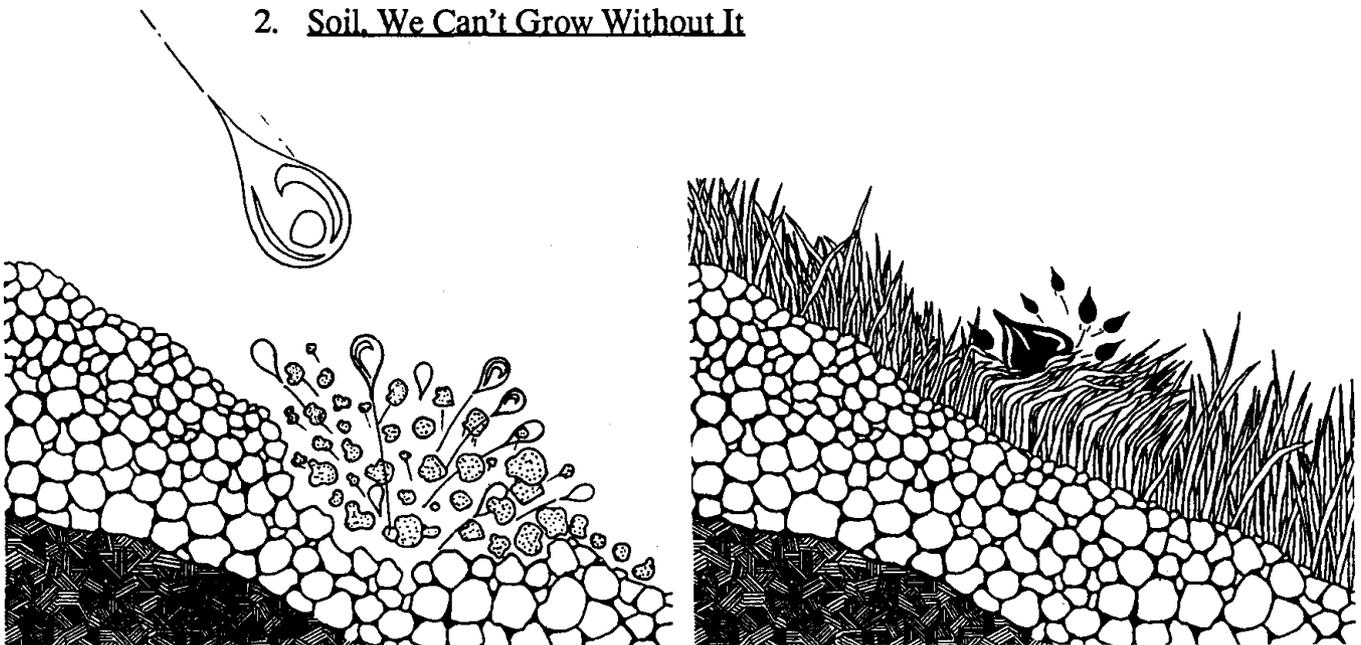
6. Observe how much water runs out of the 'V' notch and observe cleanliness of water.
7. Discuss what would happen to unprotected soil over 5 or 10 years. What about the other samples? What would you want around your house, bare soil or protected soil? What would a farmer want in his field? A farmer needs to know ways of soil conservation otherwise he will lose his valuable top soil.

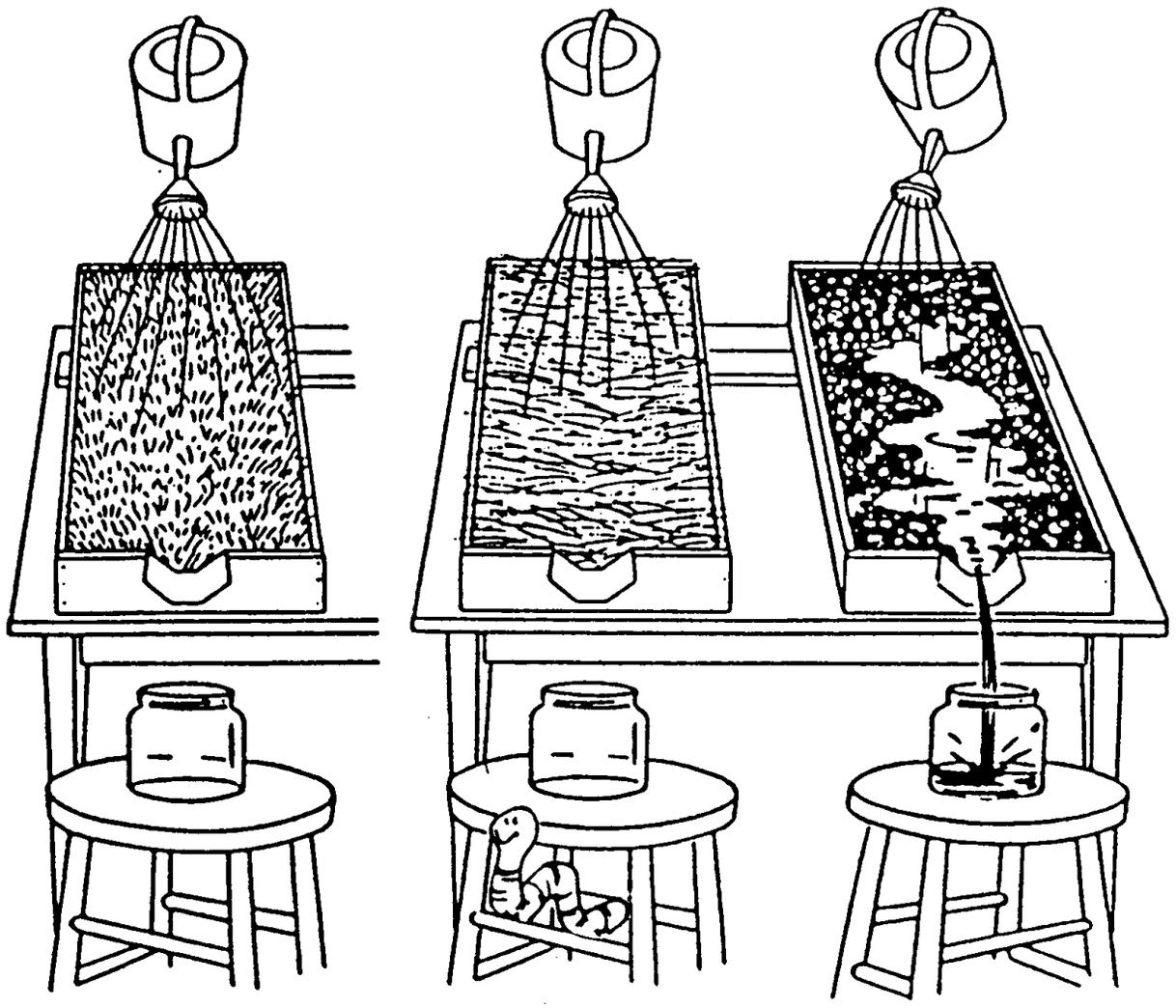
**Additional Activities:**

1. **Down-to-Earth Art, Soil Collage**  
Materials: soil, glue, markers, and heavy paper or cardboard. Use real soil to make pictures. First sketch a plant showing the roots beneath the ground's surface. Trace over the roots with a brightly colored marker. Spread glue over the soil area (omitting the roots) and sprinkle soil over the glue. Wait for the glue to dry and shake off the excess.
2. **Soil Color Collage:**  
Have the students make pictures with above process, using different colors of soil only. The different colors of soil can be samples brought by students. Point out that erosion takes away valuable organic matter--leaving the soil with a yellow color. The darker the soil, the richer it is in organic matter. Organic matter holds nutrients and water for plants.

**Adapted From:**

1. Teaching Soil and Water Conservation
2. Soil, We Can't Grow Without It





Sod

Mulch

Bare

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## Activity 7 Plant Conservation Roots Affect the Soil



**Subject Area:** Science

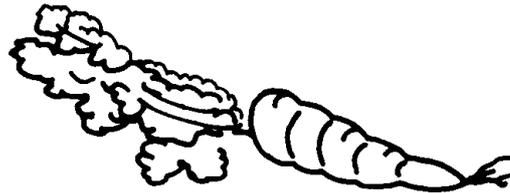
**Objective:** 1. The student will demonstrate how plant roots spread out and hold the soil in place.

**Suggested  
Grade Level:** 3-4

**Background:** As plants grow, their roots spread into the soil. Roots break up rocks by pushing into cracks and crevices and splitting them apart. This helps add minerals to the soil. Roots also loosen the soil, allowing air to seep under the ground. Air stimulates plant growth and speeds up decomposition of organic materials within the soil. Plants and roots help hold the soil in place so it will not erode.

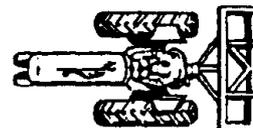
**Materials:**

1. Soil
2. Clear plastic cups
3. Gravel
4. Grass seeds
5. Masking tape
6. Pencil or pen



**Procedure:**

1. Give each student a cup, gravel, soil, plenty of seeds to cover the soil in their cup, and a piece of masking tape for a label.
2. Have them put gravel in their cups for drainage, then fill three-quarters full with soil.
3. Observe the soil, how does it feel, does it crumble, what color is it? Record all observations on the chalkboard.
4. Place the seeds on the soil and cover with a very, very thin layer of soil.
5. Water enough to make the soil moist not wet.
6. Students should label the cups with their name, and the date.



7. Depending on the seed, you should see growth within a few days. Ask the students such questions as: What do the seeds need to grow (soil, sunlight, water)? What happens as the seed begins to grow? What part of the plant grows first? (roots) How long before shoots or leaves come up? Do big seeds sprout first? Do different kinds of seeds have differently shaped roots? Are the roots long or short? Which grows faster the roots or the leaves?

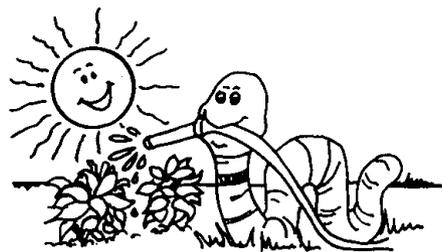


8. After the grass has grown and the roots have spread, take them out of the containers and observe. How does the soil feel, does it break apart easily, how has the soil changed, does soil hang on to the roots? Record observations. Compare to observations from the first day. How do the roots affect the soil? How would plant roots help the plant during a strong wind or rain? Imagine two steep hills, one is bare, one is covered with growing plants. Which hill will be taller after years and years of weathering (plant covered). Why are plant roots important for conserving soil? (The roots hold the soil in place so it isn't washed or blown away).

Adapted  
From:

1. Soil We Can't Grow Without It

## Activity 8 Plant Conservation Plants Drink Water Too



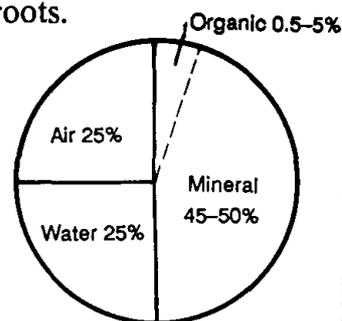
**Subject Area:** Science, Math, Language Arts

- Objectives:**
1. The students will learn how water moves up to plant parts from the soil.
  2. The students will realize new vocabulary words and put them in alphabetical order.
  3. The students will compute minutes into hours and minutes.

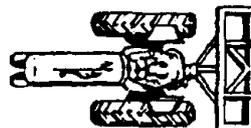
**Suggested  
Grade Level:** 3-4

**Background:** Although soils differ somewhat in composition, the average volume of soil ingredients are: 45% minerals, 25% water, 25% air and 5% organic matter. The mineral particles give soil texture. The area between the mineral particles is called pore space. Water and air occupy the pore spaces which act as tiny capillary tubes. Water and nutrients are absorbed by the roots and carried through the plant. The xylem vein carries water from the roots to the leaves, the phloem vein carries water from the leaves to the roots.

- Materials:**
1. Celery stalks
  2. Food coloring
  3. Glass jars
  4. Worksheets 1 and 2
  5. Ruler



- Procedure:**
1. This experiment shows capillary action.
    - a. Add food coloring to water in a glass jar.
    - b. Select a large light colored celery stalk with leaves on it.
    - c. Cut the root end of the celery stalk off square.
    - d. Put the end in the glass. Write down the rate the dye moves up the stalk. Do this by how long it takes the water to move one inch, two inches ....
    - e. Use the attached chart to record results. (Worksheet 2).
  2. After the celery top is colored from the water, cut the stalk in half and look at a cross section of the inside. You will see the veins that carry the water up and down through the plant. The ones that carry water from the roots to the top are called xylem and the ones that carry the water down are called phloem. What would happen if there suddenly wasn't any water for



the plant to drink? (The plant would die.) Is water necessary for plants to live? (Yes) Would plants grow well in polluted water? (No) Why? (They need nutrients and good things not pollution.) If students have problems understanding, compare to their need of water.

3. Complete Worksheet 1.

# Plants Drink Water Too!

**Directions:** Put a "T" if the sentence tells something true about our experiment.  
Put an "F" if the sentence tells something that is not true about the experiment.



\_\_\_\_\_ We cut the end off the celery.

\_\_\_\_\_ The celery did not drink water.

\_\_\_\_\_ Our celery stalk had leaves on it.



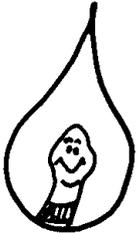
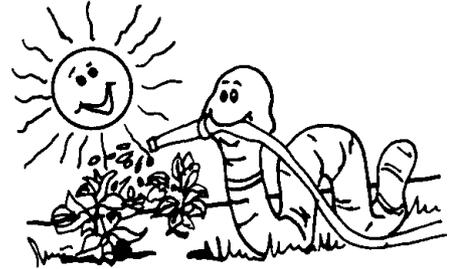
\_\_\_\_\_ We added color to the water to make it pretty.

\_\_\_\_\_ We added color to the water so we could see how it travels up into the plant.

\_\_\_\_\_ The veins in the celery that carry the water up into the plant are called xylem.

\_\_\_\_\_ The dye moved up to the top of the celery in 5 minutes.

\_\_\_\_\_ Plants could live without any water.



Put these water words in alphabetical order.

xylem \_\_\_\_\_

celery \_\_\_\_\_

phloem \_\_\_\_\_

water \_\_\_\_\_

drink \_\_\_\_\_

plant \_\_\_\_\_

**Directions:** Draw your celery stalk below. Then, as the dye moves up the stalk, color yours to match.

**Name** \_\_\_\_\_

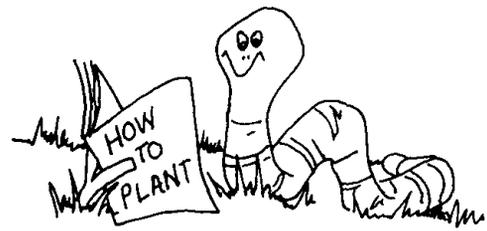


Starting at the bottom of this column, record the number of minutes it takes the dye to reach each inch. Change the minutes into hours and minutes.

9	_____ Minutes = _____ Hours and _____ Minutes
	_____ Minutes = _____ Hours and _____ Minutes
8	_____ Minutes = _____ Hours and _____ Minutes
	_____ Minutes = _____ Hours and _____ Minutes
7	_____ Minutes = _____ Hours and _____ Minutes
	_____ Minutes = _____ Hours and _____ Minutes
6	_____ Minutes = _____ Hours and _____ Minutes
	_____ Minutes = _____ Hours and _____ Minutes
5	_____ Minutes = _____ Hours and _____ Minutes
	_____ Minutes = _____ Hours and _____ Minutes
4	_____ Minutes = _____ Hours and _____ Minutes
	_____ Minutes = _____ Hours and _____ Minutes
3	_____ Minutes = _____ Hours and _____ Minutes
	_____ Minutes = _____ Hours and _____ Minutes
2	_____ Minutes = _____ Hours and _____ Minutes
	_____ Minutes = _____ Hours and _____ Minutes
1	_____ Minutes = _____ Hours and _____ Minutes

Record when the celery was put in water.  
Date \_\_\_\_\_ Time \_\_\_\_\_





## Activity 9 Plant Conservation

# Plants Need Light, Air, Water and Soil to Survive

**Subject Area:** Science

- Objectives:**
1. The students will be able to name four things a plant needs to live and grow.
  2. The students will be able to name the substance that makes plants green, chlorophyll.
  3. The students will be able to recognize that all food comes directly or indirectly from plants.

**Suggested  
Grade Level:** 3-4

**Background:** Plants are important to all of us. They provide food and oxygen. We use trees to build homes, make furniture, paper and to supply some cover from wind and weather. Other plants help prevent soil erosion, beautify our land and they also provide oxygen and food.

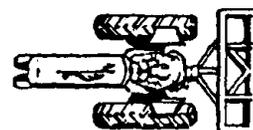
Plants are the beginning of all food chains so a meat diet is also dependent on plants. Animals and people depend on food that green plants make. Plants need sunlight, air, water and soil to live.

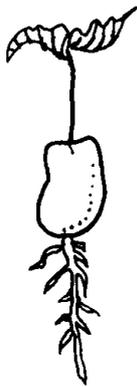
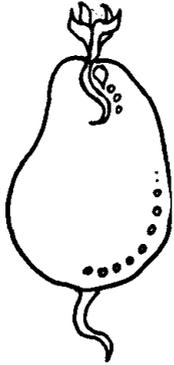
Sunlight and chlorophyll help plants make food from air and water. Chlorophyll is a chemical that also makes plants green when activated by sunlight. The soil helps the plant grow by providing food, water and nutrients for the plant to absorb through its roots.

- Materials:**
1. Bean seeds
  2. Soil
  3. Clean milk cartons for pots
  4. Petroleum jelly
  5. Clear plastic bags
  6. Opaque plastic or paper bags
  7. Leafy plants
  8. Plastic lid
  9. Paper towels



- Procedure:**
1. Have students list reasons why plants are important.



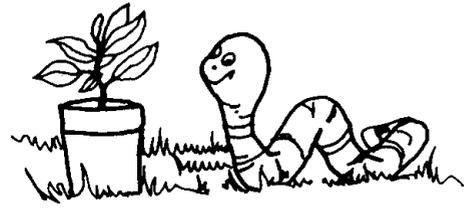


2. Have students speculate what would happen if there were no plants. What would we eat? How would we breathe? What would hold soil on the land?
3. What do we need to live? What do plants need to live? Introduce the word chlorophyll.
4. Have students work in groups of three or four and plant three bean seeds in each of two cartons. Water both cartons and place one in a sunny window and one in a darkened cupboard. Check the plants every other day for 2 weeks. Which plant is greener? (light) Which plant is stronger? (light) Which plant has the longest stem? (dark) Which plant will probably live the longest?
5. Have students cover a leaf with dark paper or a black plastic bag. Leave it for 3 days. What happens to the leaf? (Turns yellow, loses its green color) Remove the paper and see what happens after several days. (Green color returns)
6. Have students plant bean seeds in cartons. Water one, but not the other. Observe after several weeks. Discuss.
7. Soak bean seeds in water overnight. Have students place them between a paper towel and a plastic lid. Keep the paper towel moist. How long do the seeds grow without soil?
8. Have the students cover two leaves with petroleum jelly. What happens to the leaves after a week? Carefully remove the petroleum jelly from one of the leaves. What do you think caused the results?
9. Have students record all of their observations.

**Adapted  
From:**

1. Soil Conservation Topics Educational Unit

**Activity 10**  
**Plant Conservation**  
**Growing Plants from Germinated Seeds**



**Subject Area:** Science, Language Arts

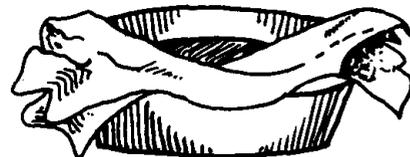
- Objectives:**
1. The students will understand the steps for planting and germinating seeds by completing a sequential worksheet.
  2. Students will keep a complete record on their plant.
  3. The students will follow a set of written directions.
  4. The students will learn how to properly grow and take care of a plant by giving it the necessary ingredients; air, sun, water and soil.

**Suggested  
Grade Level:** 3-4

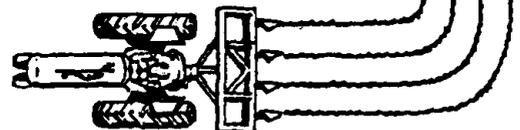
**Background:** Growing plants in or out of the classroom is a fun and rewarding learning experience for children.

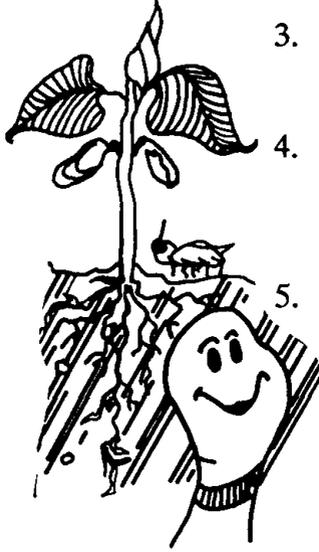
If you have the space, you might want to consider an outdoor school or community garden which can be shared by many classes and perhaps become a total school project.

- Materials:**
1. Empty vegetable cans - leave on the labels
  2. Gravel for drainage
  3. Hammer and nails
  4. Potting soil
  5. Seeds like tomato, corn, beans, etc.
  6. Aluminum pie tin
  7. Shallow dishes for germination
  8. Paper towels
  9. Worksheet 1
  10. Construction paper and glue
  11. Worksheet 2



- Procedure:**
1. Pass out copies of Worksheet 1.
  2. Ask students to cut apart the nine illustrations and lay them in order to show how a bean grows from the beginning.





3. Discuss and check students answers. Have them paste the squares down on construction paper. Have the students title their final work.
4. Have each student or group of students germinate their vegetable seeds in a shallow dish. Have the students use completed worksheet 1 as a set of directions.
5. Plant the germinated seeds. Match the plants to the can label, if you can.
  - a. Use a hammer and nail to punch holes in the bottom of the can.
  - b. Put a layer of gravel in the bottom of the can.
  - c. Add soil to about one inch of the top of the can.
  - d. Plant the plants approx 3/4" deep (make sure they put the correct seed in the matching labeled can.
  - e. Have the students keep track of how much water they apply to the plant. Water the plants to keep the soil moist but not soggy.
6. Pass out copies of Worksheet 2 and have students fill in data everytime an activity is completed.

**Adapted  
From:**

1. Conservation for Children
2. Creative Ways to Cultivate Agriculture in the Classroom



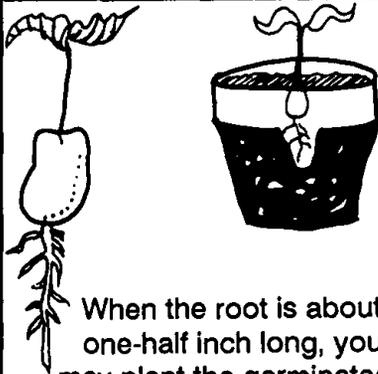
Place two wet paper towels on the bottom of a shallow dish. A pie plate is good.



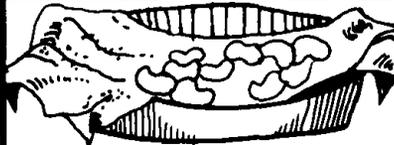
In several days some of the seeds will germinate, grow a root.



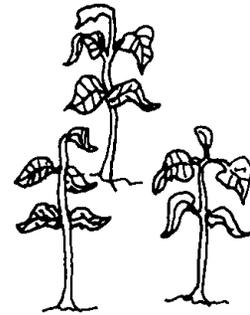
Water the pot when the soil dries out.



When the root is about one-half inch long, you may plant the germinated seed in a small pot with dark rich dirt. Put the seed about one inch under the top of the dirt.



Put ten seeds on the towels and cover with two more wet paper towels.



Soon the seed will sprout and then as it grows larger it will grow leaves

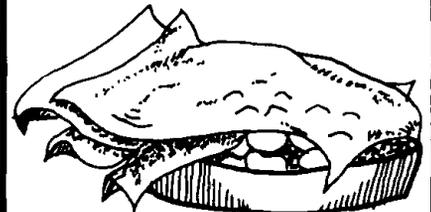
Sprinkle the towels with water everyday. Keep towels moist. DO NOT LET THE SEEDS STAND IN A LOT OF WATER, AS THIS WILL CAUSE THEM TO ROT.



Plant it outdoors if it is spring and harvest.



Place the dish in a warm place; near the furnace, heat register or in a sunny spot.

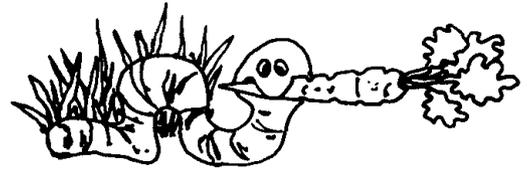




# Activity 11

## Plant Conservation

### Do You Eat Plants?



**Subject Area:** Science, Social Studies

- Objectives:**
1. The students will realize that their food comes from plants (directly and indirectly).
  2. The students will realize the process grains go through to become food on the grocery store shelf.

**Suggested Grade Level:** 3-4

**Background:** All the food we eat is directly and indirectly dependent on plants. Flour for cookies and cakes comes from the wheat plant. Sugar for candy can come from sugar cane or sugar beets (another plant). Fruits and vegetables are from plants and trees. Cattle, chickens and hogs eat grain from plants. We get our meat from animals that depend on plants for food. Our food is indirectly dependent on plants.

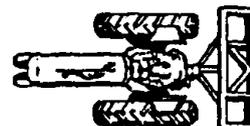


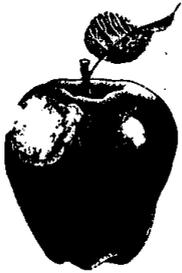
**Soil to Store Process:**

The food we eat from plants, such as cookies (for example) takes a long process to get to our grocery store shelf. Cookies begin on the farm as wheat seed. The farmer plants the seed, helps it grow and then harvests the wheat grain when it has turned golden brown. The grain is sold to the grain elevator, where it is stored until it can be sold to the mill. The mill processes the grain into flour. A bakery will buy the flour to combine with other ingredients to make into cookies or other products. The bakery sells the cookies and wheat products to a wholesale distribution center. The wholesaler sells and distributes the cookies and wheat products to a grocery store, where these items are available to you the consumer.

- Materials:**
1. Wheat snack (ie. bread, muffins, cookies, cake, etc.)
  2. Worksheet 1
  3. Trucks made from pattern (Activity Sheet 2)

- Procedure:**
1. Give the students a snack made from wheat.
  2. Ask them what they are eating. Are they eating a plant? (Indirectly they are).

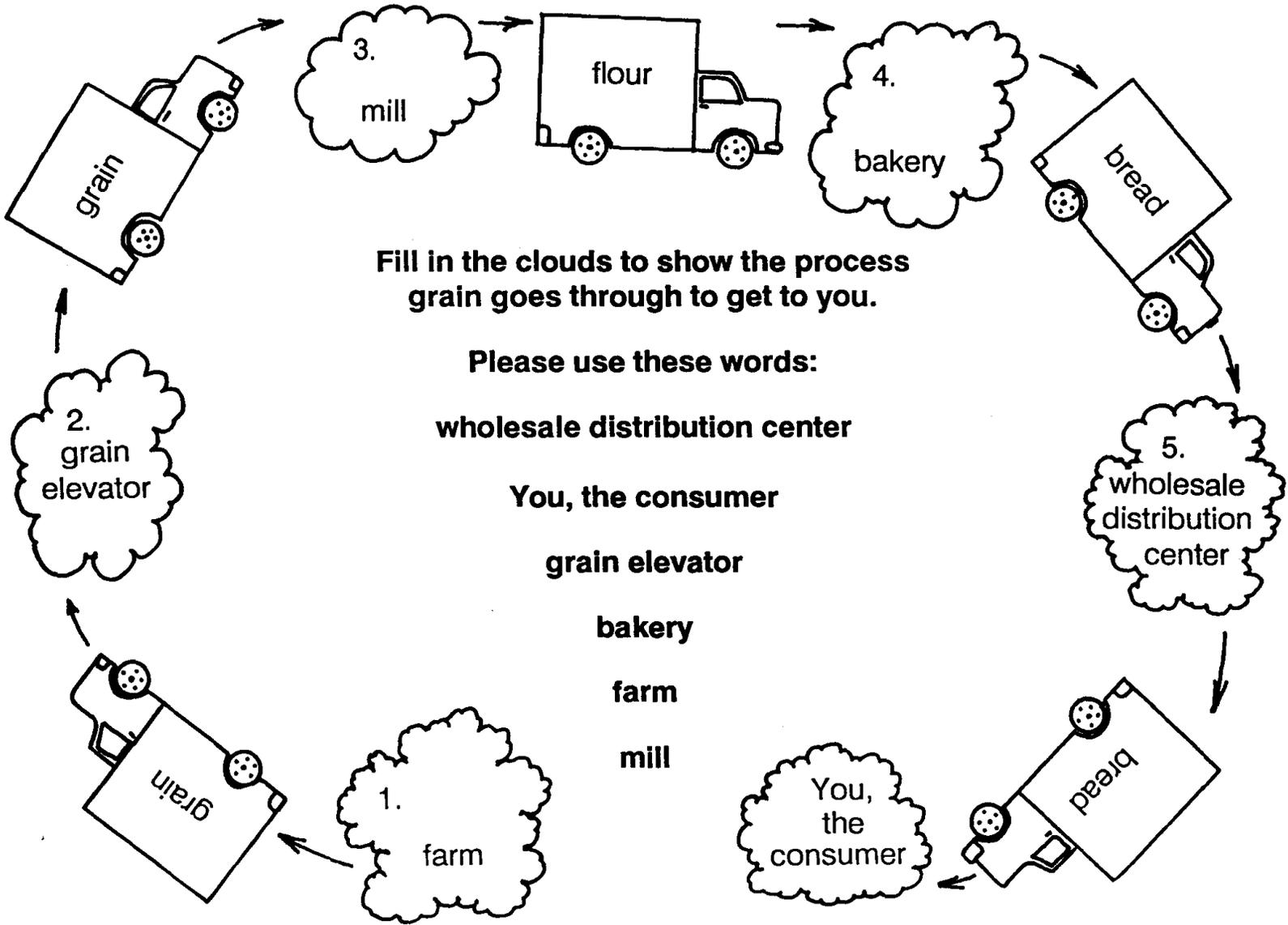




3. Explain the process, from the soil to the store, it took to get this snack to them. Use truck patterns and chalkboard, follow grain process (Activity Sheet 1) as an example. Brainstorm all of the foods we eat from the wheat plant.
4. Can you think of other foods we eat that are from plants. (corn products, soybean products, fruits, vegetables, nuts, sugar beets and sugar cane products, etc.)
5. Is meat from a plant? We do depend on plants so we can eat hamburger and porkchops. Explain.
6. Can you think of any food we eat that is not dependent on plants to grow or/and be made for our use.(No).
7. Have students complete Worksheet 1.

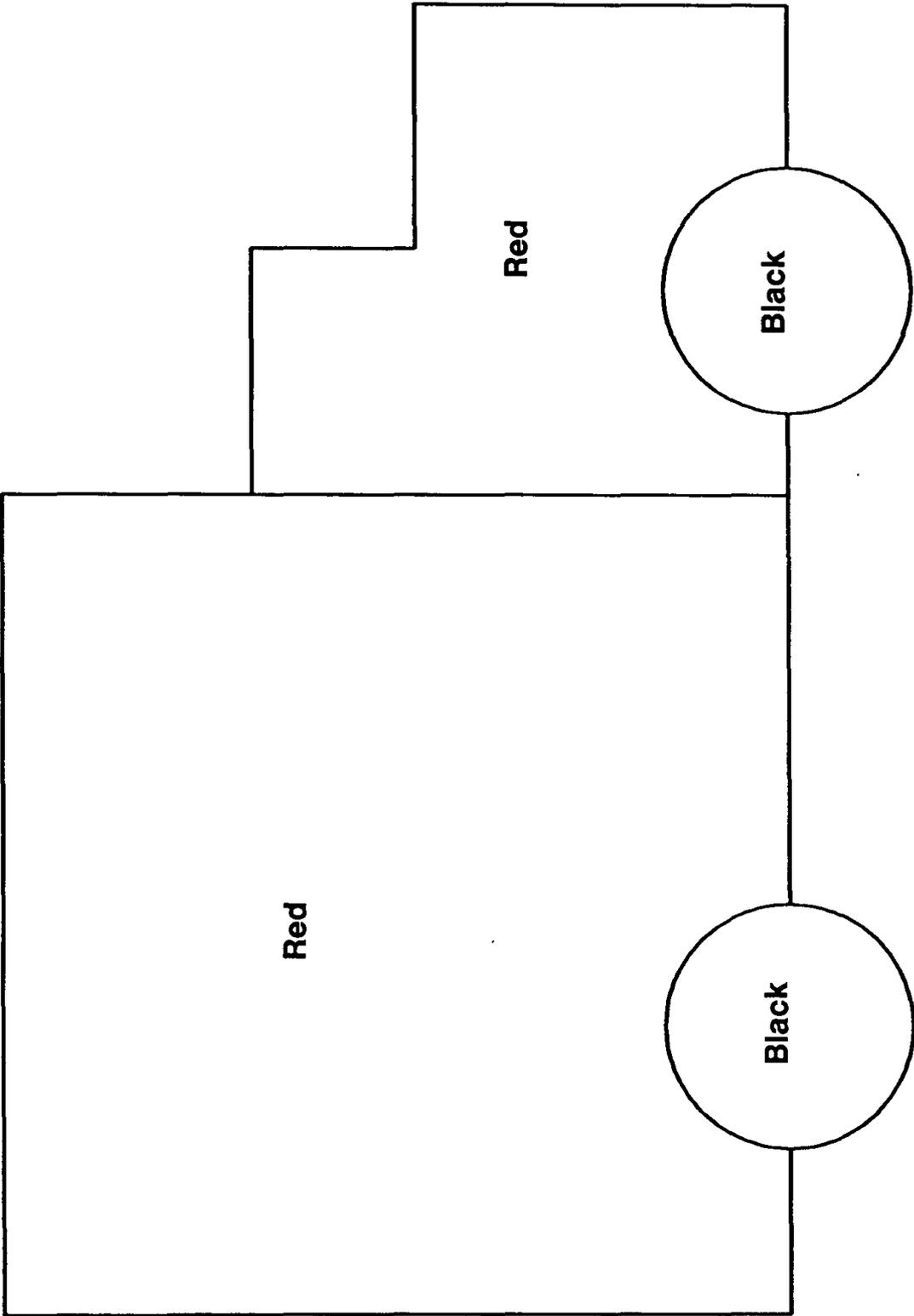
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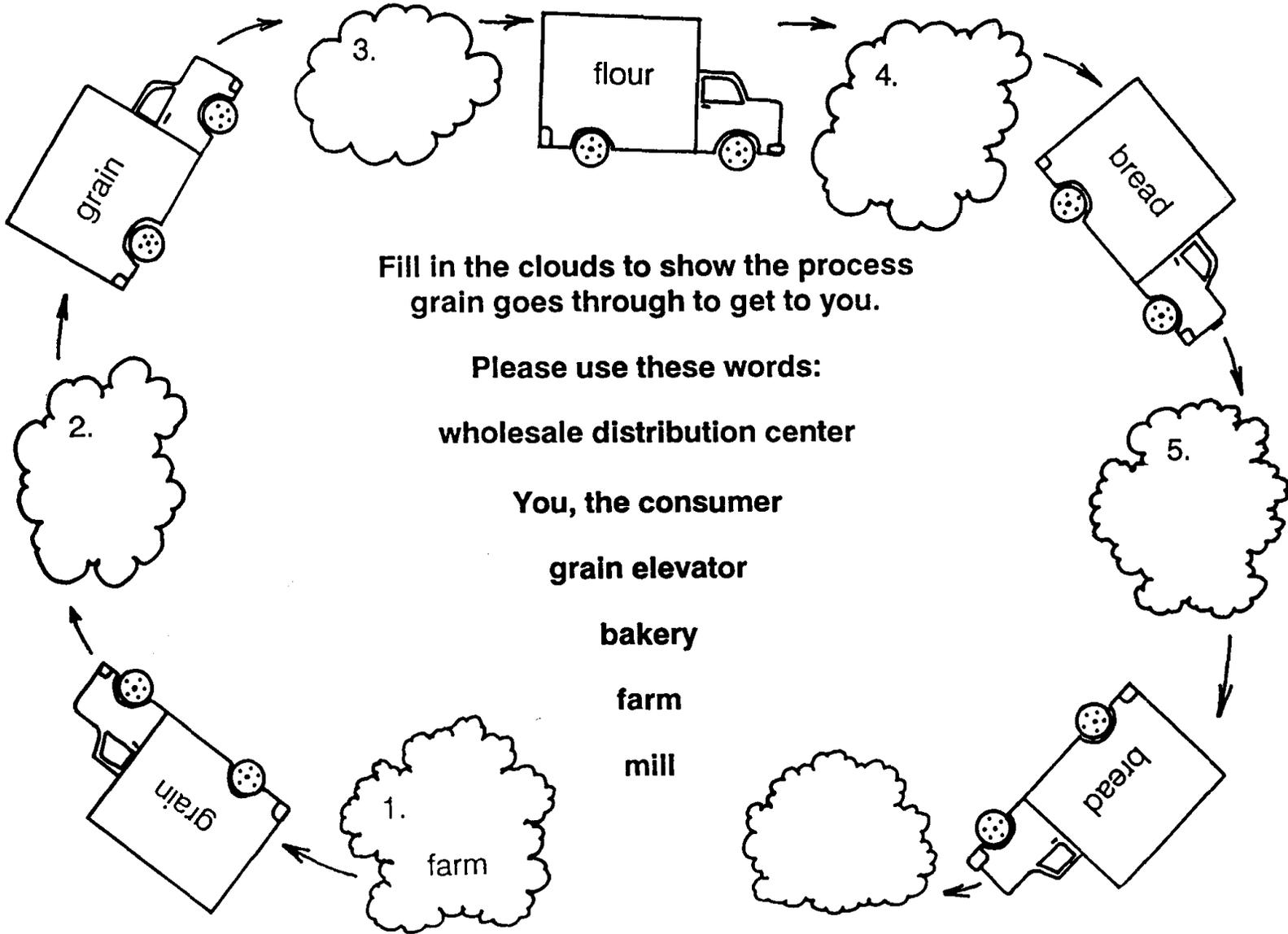
1. Nebraska's Ag In The Classroom Learning Activities Notebook



Fill in the clouds to show the process grain goes through to get to you.

- Please use these words:
- wholesale distribution center
  - You, the consumer
  - grain elevator
  - bakery
  - farm
  - mill





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## Activity 12 Plant Conservation Your Community, My Community



**Subject Area:** Science, Art

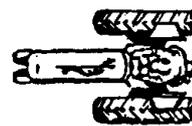
- Objectives:**
1. The students will understand a grass community by comparing to their own community.
  2. The students will create a mural using concepts learned in this activity.

**Suggested  
Grade Level:** 3-4

- Materials:**
1. Dig up a corner of a yard or grassy area, 10" x 10" and about a foot deep. Put in a plastic bag and tie to transport to the classroom.
  2. Large white paper
  3. Mural paper
  4. Magazines



- Procedure:**
1. Ask the students what kinds of things are in the community where they live? Is there shelter for living things? Is there food for living things? Is there water for living things? This is your community.
  2. The students know that plants are used for many things. We eat plants but also some animals and insects make their home in plants.
  3. Your front yard could be considered a community in itself. It is a grass community. What lives there? Where do these living things find shelter? How do they get food and water? (Be sure to include all living things, grass, worms, insects, etc.).
  4. Lay out the soil sample on white paper. Sort through it to find what lives in this community. Discuss the student's findings.
  5. Divide the students in half. Have one group paste a clump of grass in the middle of the mural paper. Have students find pictures in magazines or draw pictures of everything in this grass community.
  6. Have the other half make a mural depicting their community.
  7. Have students compare the two murals.



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## Activity 13 Water Conservation Water Uses



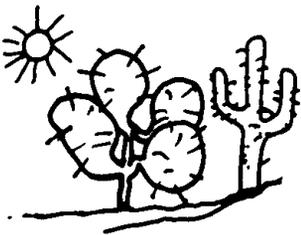
**Subject Area:** Science, Math, Language Arts

- Objectives:**
1. The students will understand the many uses for water and ways to conserve this resource.
  2. The students will use math to figure how much water could be saved every day.
  3. The students will illustrate ways to conserve water by completing sentences.

**Suggested  
Grade Level:** 3-4

**Background:** No living thing can survive without water. Humans can exist for long periods of time without food, but just a few days without water can be fatal. Every system in our body needs water. Water makes up about 83 percent of our blood. Water transports food and body wastes. It helps our bodies digest food. It lubricates our joints and keeps our bodies cool. On an ordinary day, the human body gives off about two and one-half quarts (two liters) of water through breathing, perspiration and excretion. This is replaced through the food we eat and the liquids we drink.

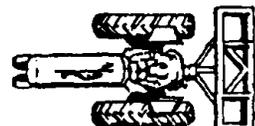
Plants and animals adapt to their environment. Koalas take all of their liquid needs from the leaves of the plants they eat. (Koala means "no water".) Kangaroo rats metabolize about two ounces of water every five weeks from the dry seeds they eat.



Desert plants have root systems that utilize their meager water supply very efficiently. Saltwater creatures are capable of using water that humans cannot, because they have special filtration systems in their bodies that eliminate the salt. Humans use water to survive. It is second to air in importance to us. But we also use water for fun, industry and energy.

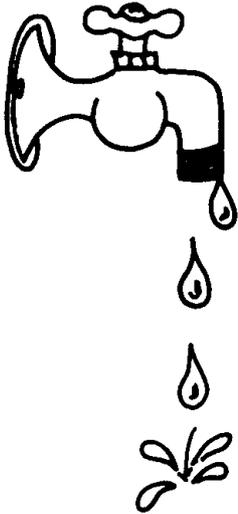
How can the average citizen help to solve the nation's water problems? An answer to this question comes from an engineer in a municipal water purifying plant:

"Each one of us can help the problem by a very simple action--using only as much water as we need. Because water has been so cheap for so long, most



of us have developed bad habits when it comes to using water. We can really get by with less. If we conserve water we will relieve demand on our water purifying plants.

It's true the amount of water saved by our reducing domestic usage may be small compared with what industry can save, but it can be significant."



As noted above the amount of water to be saved in the homes of America may seem small compared with what industry can save through recycling or by changing manufacturing procedures. But there can still be significant value for students to become aware of how much water they use, and to learn ways to use only as much as they need.

Water is one of our most basic natural resources. If students can learn to use this resource with care, they will hopefully develop habits and attitudes which will carry over into the use and care of other natural resources.

The water we borrow from the natural water cycle should be returned to that cycle in as pure a state as possible. By borrowing less water from the cycle, we can reduce pollution by reducing demands on water-treatment facilities.

**Materials:**

1. Five gallon water cooler
2. Small dixie cups
3. Worksheet 1 and 2
4. Scale

**Procedure:**

1. Obtain a 5-gallon water cooler. Weigh the container empty and then when it is full of water. Have an agreement among all class members that this cooler is the **only** place they will get their drinking water. Allow students to obtain a drink whenever they wish and record the length of time it takes to use all the water. (The amount of water in the container cannot be seen, so the class will not know how much of the "resource" remains.)

Next, refill the container and again have students use this as their only source of water. This time, weigh the water taken each time a student gets a drink (use grams). Keep a running subtraction record and see how much longer the "resource" will last.

2. Discuss how all living things need water.
3. Make a list on the chalkboard or chart paper of the uses of water. Put them under these headings: Personal Use, Recreational, and Industrial. Don't forget irrigation needs by farmers to grow crops. After brainstorm-

ing go back and discuss how some water uses could be water wasters (i.e. brushing your teeth while the water runs) and how some could be water savers (only turning the water on when your actually using it while brushing your teeth).

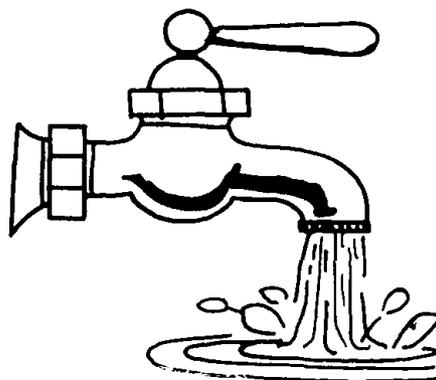
4. Pass out copies of Worksheets 1 and 2. Have students complete it in one day. Then go over it the next day. Add up the totals for the whole class for an estimated grand total of water usage.
5. Make a rule that tap water within the classroom can only be used for hand washing. Three days later, ask the students to express their feelings about the exclusive way the tap water is being used. What problems have been caused because of this? Relate this activity to other sources of water, such as rivers and lakes. Discuss the problems that would arise if a similar decision was made to limit its use for a specific thing such as irrigation, recreation, fish and wildlife, etc.
6. Give each student a certain number of water trip tickets. Each time they get a drink, use the bathroom, or use water for any other purpose, they must surrender a water trip ticket. Make the price of a trip progressively higher each day, continuing the experiment for one week. What effect does this have on water consumption? How do students feel about it?

**Additional  
Activities:**

1. For punctuation practice have students complete Worksheet 3.
2. Worksheets 4-10.

**Adapted  
From:**

1. Story of Drinking Water
2. Ecology and Energy Action Pack  
McDonald's Corporation
3. Conservation for Children





There is little danger of North America running out of water. But there is a danger that we will run short of *pure* water. You can help prevent this by using only as much water as you need. If you study how you use water now, you will be able to find ways to use less.

### Water You Use Yourself

Study the two charts below. Then keep this sheet with you for a **day**. Mark it each time you use water. You can use the back of this paper to do your figuring. Remember this is an estimate, not an exact measure of how much water you use. Therefore you can use the *average* amount given in the second column when you do your figuring. For example if you get six drinks of water a day, you would estimate  $6 \times 1/4 = 1\text{-}1/2$  gallons. (Note: The averages assume you let the water run to get hot or cold. You would not, for example, drink  $1/4$  gallon of water each time you get a drink, but that much would run from the faucet if you let it run to get cold.)

How You Use It	Average Amount for One Use	Put X Below for Each Use	Total
taking a bath	30 gallons		
taking a shower	20 gallons		
flushing a toilet	3 gallons		
washing hands or face	2 gallons		
getting a drink	$1/4$ gallon		
brushing teeth	$1/4$ gallon		
other	you estimate		

### Your Share of Your Family's Water

Some water is used for the food of everyone in your family, such as water for cooking and cleaning. This chart can help you estimate your share of that water. Suppose, for example, that there are five people in your family, if you estimate that water for meals, cleaning and other family uses equals 100 gallons, your share is  $100/5 = 20$  gallons.

How You Use It	Average Amount for One Use	Put X Below for Each Use	Total
washing dishes for one meal	8 gallons		
cooking a meal	5 gallons		
using automatic clothes washer	32 gallons		
other:	you estimate		



## More or Less

Finish the following sentences with your own ideas.



1. I can save water when I brush my teeth by \_\_\_\_\_  
\_\_\_\_\_



2. I can save water when I get a drink of water by \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



3. I can save water when I wash dishes by \_\_\_\_\_  
\_\_\_\_\_

## Can You Solve This?

A family of four persons uses about 280 gallons of water a day. Suppose that this family could save 12 gallons of water each day. If everyone in the United States did the same, how much water could be saved each day?

(Assume that there are 250,000,000 people in the United States, and be sure to read the question carefully, it could trick you!)





**Directions:** Put a period ( . ) or question mark ( ? ) at the end of each sentence.

1. The most important liquid is water
2. We use water for drinking and for raising food
3. What do firemen use water for
4. In June, we swim in pools, lakes and oceans
5. When will Ann water her plant
6. I turn off the water when I'm finished brushing my teeth
7. Why did Jack and Jill go up the hill
8. Who is Captain Hydro
9. The Pacific and Atlantic Oceans are large bodies of water
10. It usually rains in December, January and February
11. Water is our most important natural resource
12. How long can humans live without water
13. Water flowing downhill turns waterwheels
14. How can I make Kool-Aid without water
15. All Plants and animals need water to live





Water is one of our most important natural resources. We could not live without it. We borrow it from the natural water cycle, use it, and then return it to the cycle. Water is not used up, but recycled. We must clean the used water before returning it to the water cycle. If it is not cleaned, then we have polluted water. The more we use, the more we have to clean.

It takes a lot of water to make the things we use.

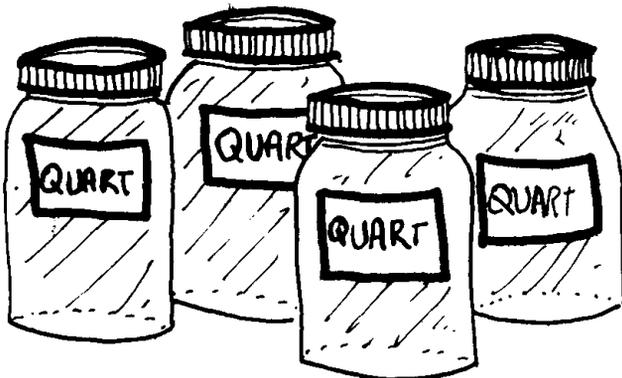
**Directions:** In the problems below, change the quart measurements to gallons by dividing. Remember that it takes 4 quarts to make 1 gallon.

1. It takes 600 quarts of water to make the paper for one Sunday newspaper. How many gallons is that?

2. It takes 2600 quarts of water to make the steel for one bicycle. How many gallons is that?

3. It takes 300 quarts of water to grow just one ear of corn. How many gallons are needed?

4. It takes 800 quarts of water to make the rubber for one car tire. How many gallons is that?





**Directions:** Find the contraction in each sentence and draw a line under it. Write the contraction and its meaning on the blanks.

1. I'm going to save water.

\_\_\_\_\_

2. When I brush my teeth, I won't leave the water running.

\_\_\_\_\_

3. I'll ask my Mom or Dad to fix the leaky faucets.

\_\_\_\_\_

4. We'll all take short showers instead of baths.

\_\_\_\_\_

5. Putting things down the toilet isn't a good idea.

\_\_\_\_\_

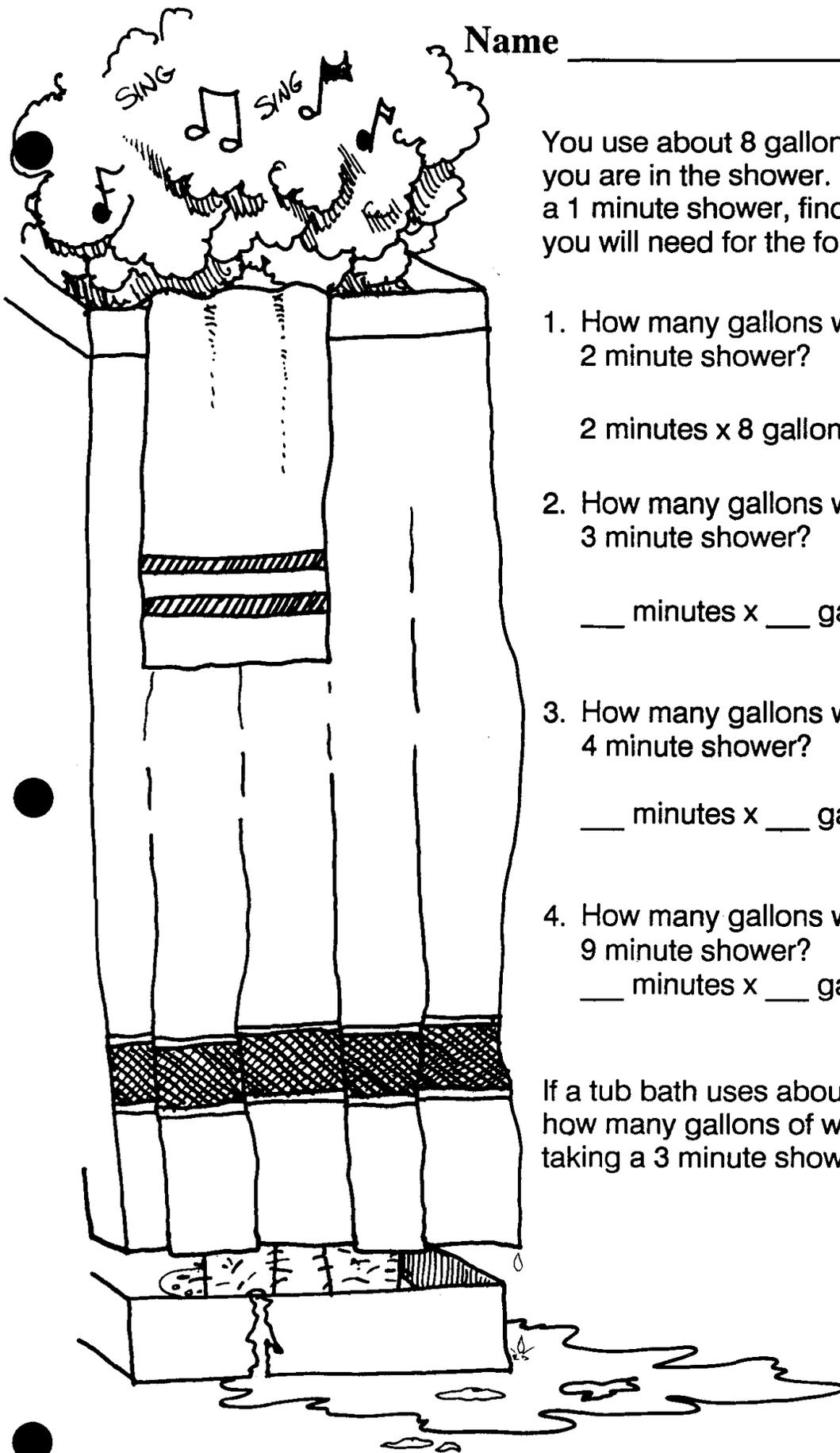
6. Everyone knows we shouldn't waste water.

\_\_\_\_\_

7. I don't think it will be very hard to do.

\_\_\_\_\_

Name \_\_\_\_\_



You use about 8 gallons of water every minute you are in the shower. If you use 8 gallons for a 1 minute shower, find out how many gallons you will need for the following showers.

1. How many gallons would you use for a 2 minute shower?

$$2 \text{ minutes} \times 8 \text{ gallons} = \underline{\hspace{2cm}} \text{ gallons}$$

2. How many gallons would you use for a 3 minute shower?

$$\underline{\hspace{1cm}} \text{ minutes} \times \underline{\hspace{1cm}} \text{ gallons} = \underline{\hspace{2cm}} \text{ gallons}$$

3. How many gallons would you use for a 4 minute shower?

$$\underline{\hspace{1cm}} \text{ minutes} \times \underline{\hspace{1cm}} \text{ gallons} = \underline{\hspace{2cm}} \text{ gallons}$$

4. How many gallons would you use for a 9 minute shower?

$$\underline{\hspace{1cm}} \text{ minutes} \times \underline{\hspace{1cm}} \text{ gallons} = \underline{\hspace{2cm}} \text{ gallons}$$

If a tub bath uses about 35 gallons of water, how many gallons of water would you save by taking a 3 minute shower.

**Directions:** Write the number that is missing in each pattern.

1. 

10	12	14	16	_____
----	----	----	----	-------

This is the last letter.

2. 

_____	2	3	4	5
-------	---	---	---	---

This is the second letter.

3. 

5	10	15	_____	25
---	----	----	-------	----

This is the third letter.

4. 

8	12	_____	20	24
---	----	-------	----	----

5. 

10	20	30	_____	50
----	----	----	-------	----

6. 

3	_____	7	9	11
---	-------	---	---	----

This is the fourth letter.

7. 

3	6	9	12	_____
---	---	---	----	-------

8. 

13	_____	33	43	53
----	-------	----	----	----

This is the first letter.

Use this code to find the letters to answer the question.

A	B	C	D	E	F	G	H	I	J	K	L	M
1	2	3	4	5	6	7	8	9	10	11	12	13
N	O	P	Q	R	S	T	U	V	W	X	Y	Z
14	15	16	17	18	19	20	21	22	23	24	25	26

What is our most important resource? \_\_\_\_\_



### Hydro Power

Moving water can light our houses, cook our food and help us to do many other things. The moving water can be used to make electricity. This is called hydro power.

First, a wall is built across a river. It is called a dam.

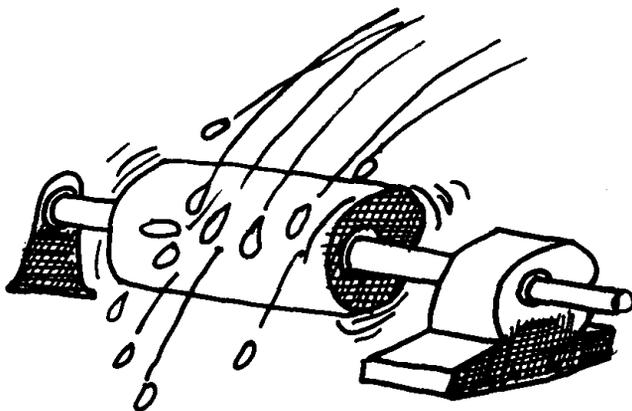
Water builds up behind the dam.

Some of the water is allowed to flow over or through the dam.



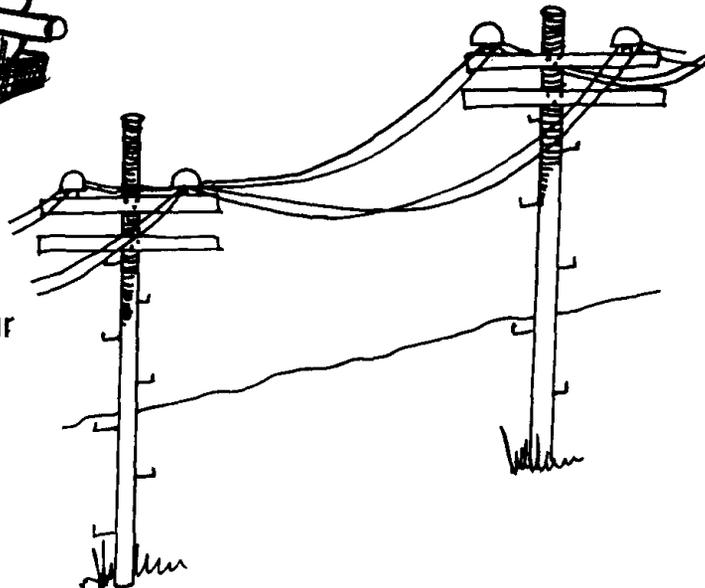
This moving water turns water wheels that run special machines called turbines or generators.

These machines change the energy of the falling water into electric power.



The electric power comes to our homes over wires.

We use the electricity to cook our food, keep us warm and give us light.

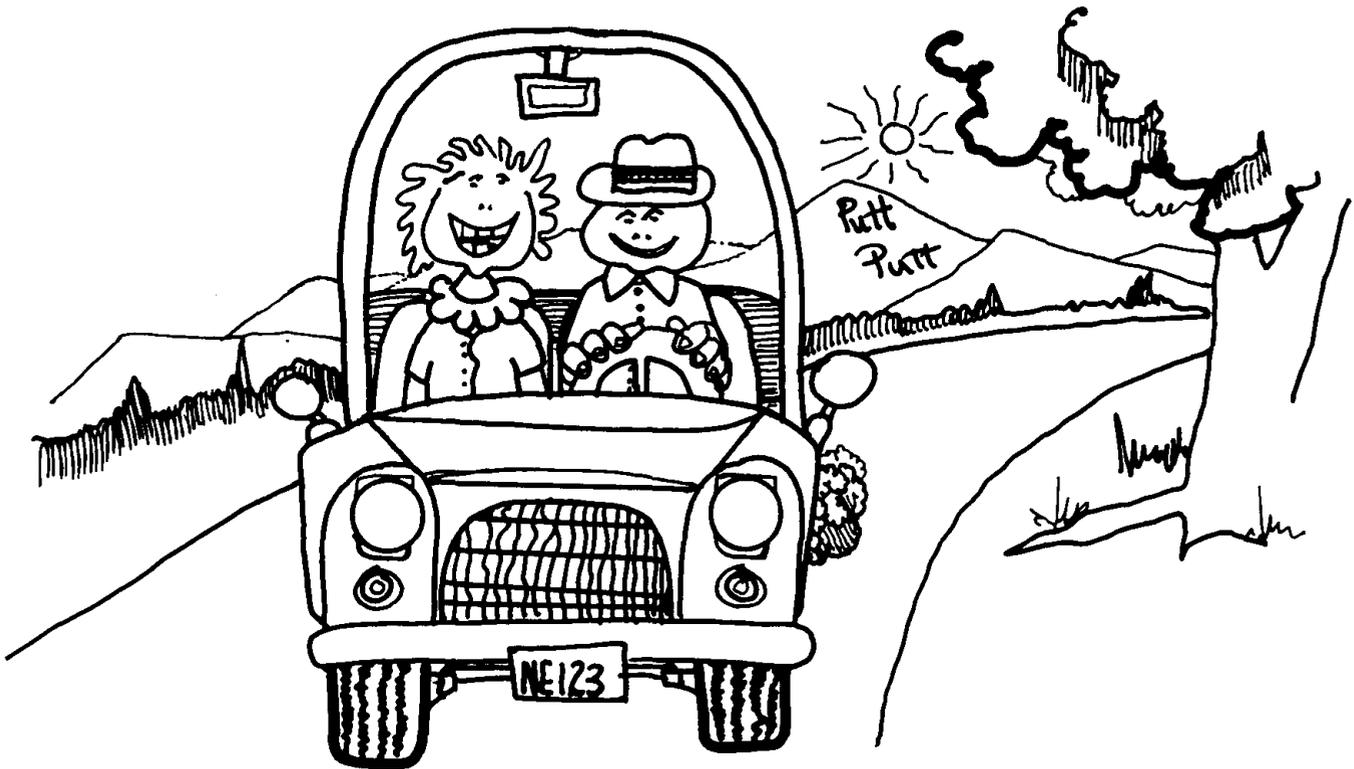


**Directions:** Write the names of things in your home that use electricity for power.

\_\_\_\_\_

\_\_\_\_\_

**Directions:** Read the story.



## The Trip to Green Mountain

Joe and Betty were going camping on Green Mountain. They left their house early in the morning because there were many things to see along the way.

First, they drove over the Golden Gate Bridge. They saw many sailboats in the water below. Next, they passed many new houses that were being built on the hillsides.

Joe was beginning to get hungry. He saw a sign that showed there were many stores along one of the roads. But Betty had packed a lunch to eat on the way, so they did not go that way. Soon, they came to a roadside rest stop where they ate their lunch. After lunch, they began to drive again. Once, Betty asked Joe to stop the car so that she could take pictures of some pretty wildflowers growing near the road.

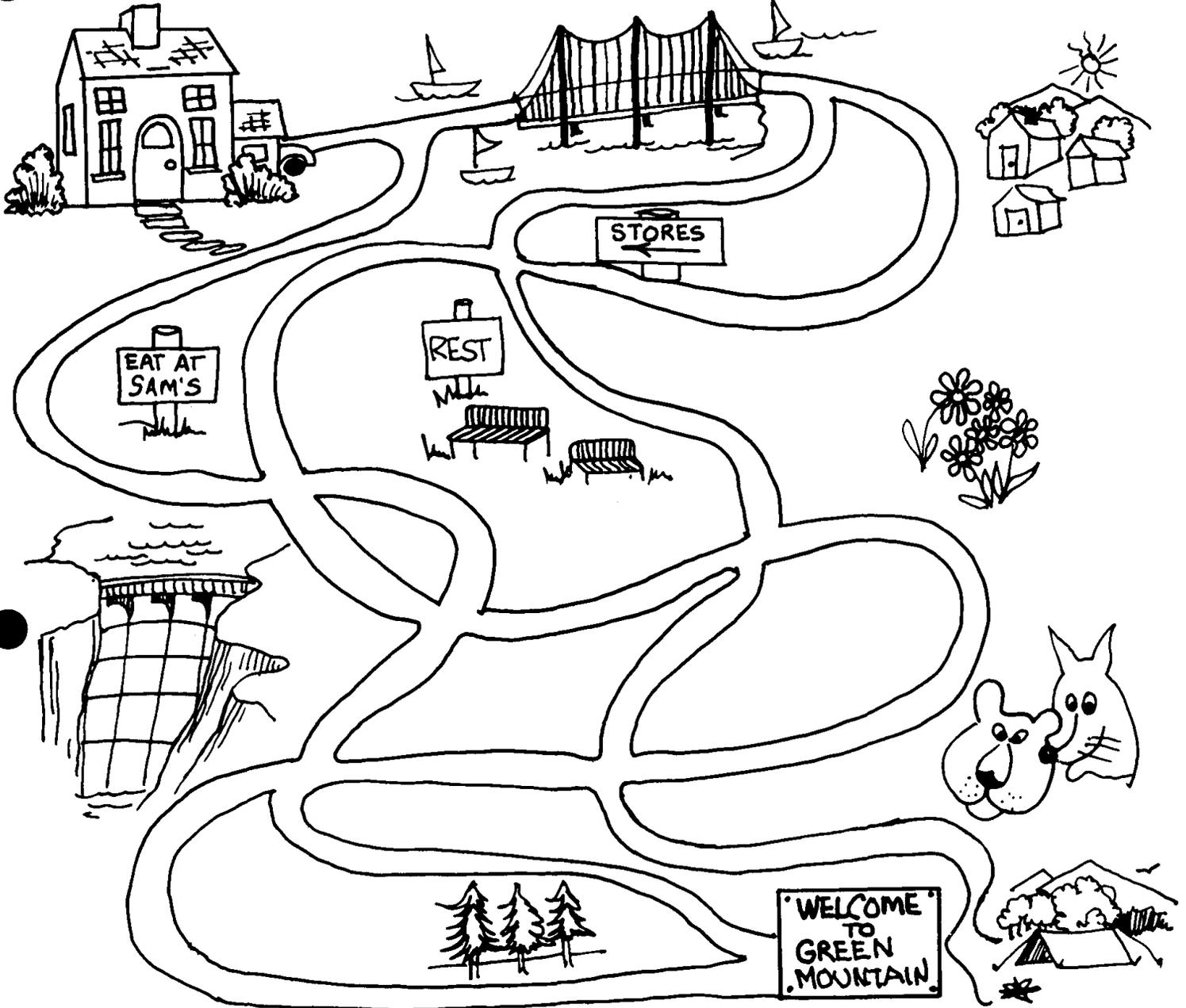
A few hours later, Betty and Joe stopped at Hetch Hetchy to see the large dam that provides water and electricity for the people who live far away.

As they began to see more and more trees, they knew they were getting closer to the Green Mountain campground. Soon, they were there.

Name \_\_\_\_\_



**Directions:** Use the story to trace the roads that Betty and Joe took to get to the Green Mountain campground.



Write the names of three things Joe and Betty passed on the way that were made by people

\_\_\_\_\_

Did these things change the environment?

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## Activity 14 Water Conservation Forms of Water



### Ice-Water-Gas

**Subject Area:** Science, Math

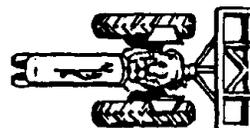
- Objectives:**
1. The students will be able to describe the three forms of water.
  2. The students will show the freezing and boiling points of water on a thermometer.

**Suggested  
Grade Level:** 3-4

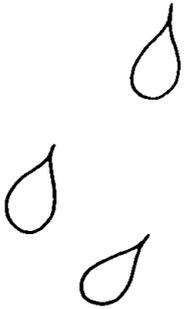
**Background:** Solid form is 2 percent of all the water on earth. Frozen water becomes strong enough to walk or skate on because the molecules of water are now holding very tight to one another. Water expands when it freezes. It can break bottles and pipes and cause cracks in rocks and sidewalks. Liquid form of water accounts for approximately 98% of the water on earth. Liquid form is in: saltwater oceans (97 percent of all the water on earth), freshwater such as lakes, streams, rivers, ponds, wells, and groundwater (1 percent of all the water on earth). The gas form of water is called steam. It exerts a powerful force when constricted and can be used to drive machinery.

- Materials:**
1. One ice cube for each student
  2. One aluminum pie pan for each student
  3. Thermometer
  4. Hot Plate
  5. Worksheet "Water Has Three Forms"

- Procedure:**
1. Give each student a tray that holds water. Tell them that you're going to give them a solid form of water and they must change it to liquid form as soon as they can. Then give each student an ice cube. Let them hold it, rub it, breathe on it but they may not use any tools to get it to melt. Time the students to see who could melt their's the fastest. How could we make this liquid into ice again? (freeze it)
  2. With strict control, warm some water - have students hold their hand high above the pan. Do you feel moist air? That is steam, a gas form of water.
  3. You have just worked with the three forms of water. One form was solid this was the ice. Name some other solid forms. (Glaciers, icebergs, ice, snow). Liquid (water) becomes solid (ice) when a temperature of the



water is below 32 degrees Fahrenheit (0 degrees Celsius). Show this on the thermometer. This is the freezing point of water.



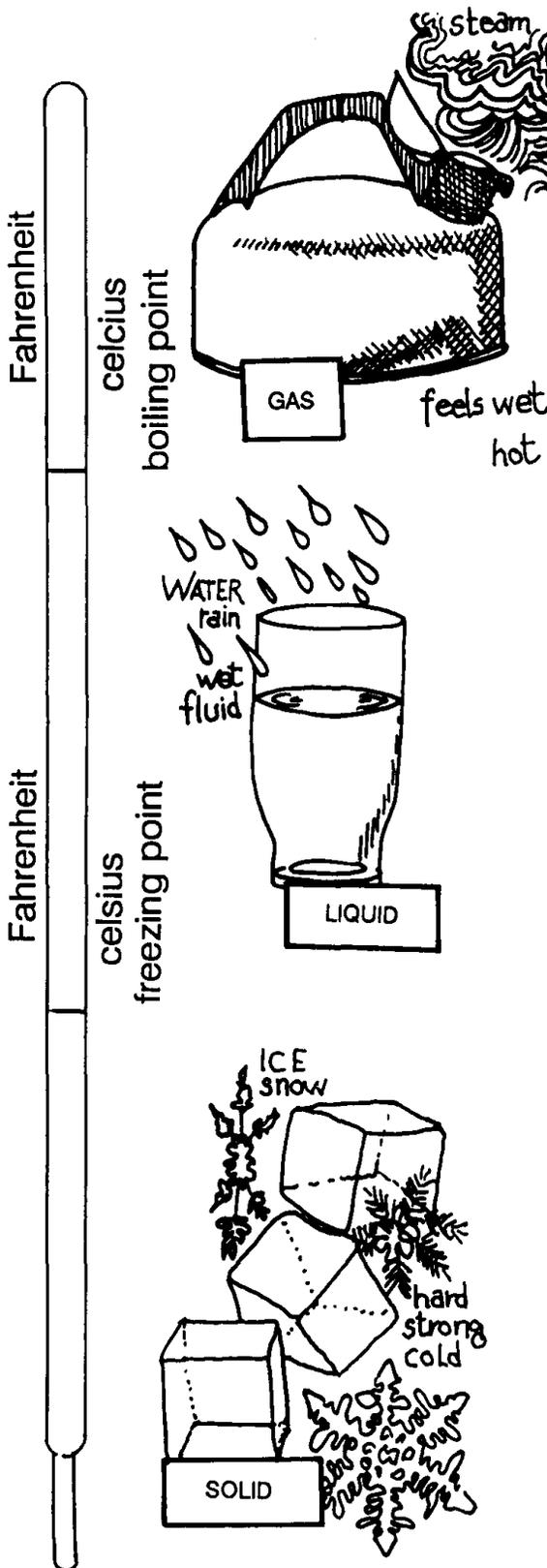
4. Another form of water is liquid. Such forms are rain, sleet, drizzle. Liquid is a fluid, it is wet. Liquid forms if the temperature of water is above 32 degrees Fahrenheit (0 degrees Celsius). Show this on the thermometer.
5. The third form of water is gas. This is not like the gas your parents put in their cars. When water is heated to boiling or beyond, the molecular bonds break and the water becomes a gas (steam). Water boils at 212 degrees Fahrenheit (100 degrees Celsius).
6. Let's review the 3 forms of water. Put these on the board:  
Liquid            Solid            Gas  
Have students suggest examples for each.
7. Pass out the copies of Worksheet 1 -- "Water Has Three Forms". Discuss the thermometer and the pictures. Notice how each set of pictures is drawn in between the temperatures necessary for that kind of water. Complete the worksheet as a class.

Adapted  
From:

1. The Story of Drinking Water



# Water Has Three Forms



1. The three forms of water are \_\_\_\_\_, \_\_\_\_\_ and \_\_\_\_\_.
2. Solid water is called \_\_\_\_\_.
3. Liquid water is called \_\_\_\_\_.
4. Water as \_\_\_\_\_ is called gas.
5. Ice is strong, \_\_\_\_\_ and \_\_\_\_\_.
6. Liquid water is \_\_\_\_\_ and \_\_\_\_\_.
7. Steam is hot and \_\_\_\_\_.
8. Write in the correct degrees for the freezing and boiling points of water on the thermometer.

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## Activity 15 Water Conservation Rainfall



**Subject Area:** Science

**Objective:** 1. The students will recognize where rain goes when it falls to the earth.

**Suggested  
Grade Level:** 3-4

**Materials:**

1. Three plastic disposable plates
2. Sponge
3. Quart of soil
4. Milk carton
5. Water
6. Nebraska maps



**Procedure:**

1. One or two days before the activity, have students bring an ordinary rock about the size of a lemon from home.
2. Cut the top out of a quart milk carton and fill with soil to about three-fourths full. Set the milk carton on a plate.
3. Have the students examine their rocks by feeling and squeezing them. Ask the students what they think would happen to raindrops if they would fall on their rocks. Have several students place their rocks into a plate. Pour water over them. Does it soak in? Does it bounce off?
4. Then ask what would happen if the raindrops fell on a sponge. Put the sponge in the plastic plate, let each child pour a little water over it very slowly until the sponge can hold no more. What happens?
5. Tell the students that soil is somewhat like a sponge. When raindrops fall, they soak into the soil. Let each child pour a little water into the soil until it becomes saturated. Continue to let them pour water into the soil until the milk carton becomes full of water and eventually flows over the carton into the plate. What is the difference between the rock and the soil? (The soil will soak up the water and the rocks will not). When the soil becomes saturated like the sponge, what happens? (When rain falls outdoors, the soil will soak up the water until it becomes saturated and begins to run off. Some soil is taken with the water when it runs off. The runoff collects in



streams, rivers, and lakes. When the runoff becomes more than the river or lake can hold, it spreads out over the land and causes flooding).

**Additional  
Activities:**

1. For vocabulary use have the students look the words up in the dictionary and then match the word with its definition. Use worksheet 1.
2. Pass out Nebraska maps and a map of the world. See if students can identify a stream, lake, river, ocean, and reservoir. Review and refer to a map legend for assistance.

**Adapted  
From:**

1. Soil Conservation Topics Education Kit



## Working with Water

**Directions:** Match the vocabulary words with their correct definition by writing the letter in the blank.

1. Stream \_\_\_\_\_

2. Lake \_\_\_\_\_

3. River \_\_\_\_\_

4. Ocean \_\_\_\_\_

5. Reservoir \_\_\_\_\_

6. Well \_\_\_\_\_

7. Aquifer \_\_\_\_\_

8. Ecosystem \_\_\_\_\_

A. A large natural stream of water emptying into an ocean, lake or other body of water.

B. A hole dug in the ground to reach water.

C. A relatively large inland body of water.

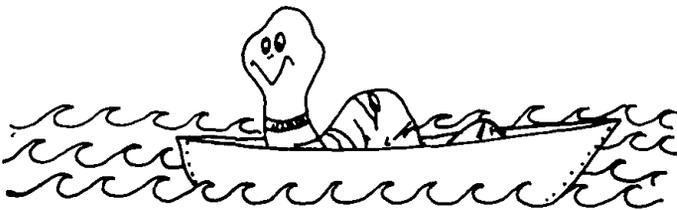
D. All living things and their environment in an area of any size.

E. A body of running water with a steady current.

F. A place above ground where water is stored.

G. A source of fresh water found below the surface of the earth.

H. The large body of salt water that covers about 72% of the earth's surface.



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# Activity 16

## Water Conservation

### The Water Cycle



**Subject Area:** Science, Language Arts

**Objective:** 1. The students will recognize and illustrate the water cycle.

**Suggested Grade Level:** 3-4

**Background:** Water doesn't disappear with our use of it in irrigation, manufacturing or consumption. The water we have now is the same water we had at the beginning of time. Water forms, dissipates, and forms again in a cycle called the hydrologic or water cycle.

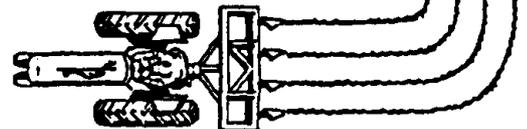
The water cycle is a gigantic circulation system operating over the earth's land and oceans in the atmosphere surrounding the earth. Being a cycle, there is no beginning or ending but for illustration, let's begin with the waters of the oceans, which cover about three-fourths of the earth.



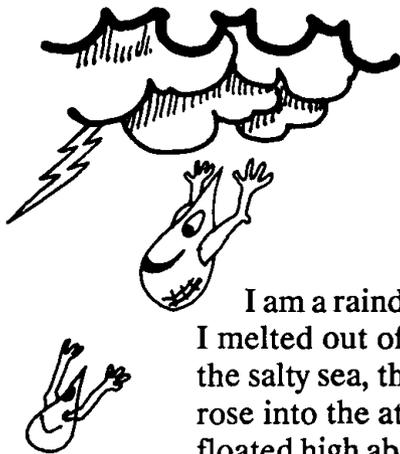
Water from the surface of the ocean evaporates into the atmosphere. That moisture in turn is lifted, eventually condensed, and falls back to the earth's surface as precipitation.

Precipitation that falls as rain, hail, dew, snow or sleet is important to people and agriculture. After wetting the foliage and ground, some of the precipitation runs off into streams and other waterways. This is the water that often causes erosion and is the main contributor to floods. Not all of the precipitation runs off. Some soaks into the ground and is available for evaporation. Some of it reaches the deeper zones and slowly percolates through to springs and seeps to maintain and replenish them during dry periods. The streams eventually lead back to the oceans, where the water is again evaporated into the atmosphere.

- Materials:**
1. Glass jar
  2. Paper
  3. Tape
  4. Activity Sheet 1-2
  5. Worksheets 1-3



- Procedure:**
1. Fill an uncovered jar 3/4 full of water. Cut a piece of paper to be the same height as the jar and about 3 inches wide. Paste this around part of outside of the jar (like a full length label). Make a line on the paper to show the current water level, beside the line write today's date. Then for 3-5 days observe what happens to the water level. It will decrease as evaporation is taking place. Each day at the same time, mark and date the water level. Continue this lesson for 4-5 days, watching the water evaporate.
  2. Generate discussion about water: Where does water come from? (ground, clouds, streams, oceans) It all comes out of the water cycle.
  3. Read the story "Diary of a Raindrop" pointing at times to Activity Sheet 1 to show where the rain drop travels.



## Diary of a Raindrop

By Roger Canfield  
Soil Conservation Service  
Henry County, Virginia

I am a raindrop and I have a story to tell. My earliest memory is when I melted out of an iceberg and dripped into the ocean. After floating in the salty sea, the sun's rays warmed the water enough to evaporate me. I rose into the atmosphere where I hit cool air and helped form a cloud. I floated high above the earth and then fell with other raindrops all the way back down and hit the land. I eventually evaporated and rose to help form another cloud, then condensed again and landed on the ground. I repeated this water cycle many times, and each time I fell to the earth my experience was different. Some of my experiences were enjoyable and fulfilling, and others painful and wasteful.

The first time I fell out of a cloud, I landed in a forest. I struck a tree leaf which kind of felt like a trampoline absorbing the shock of my fall. I dripped onto the forest floor, which was covered with a blanket of humus that acted like a sponge and absorbed me immediately. I traveled through the ground and came out of a crystal clear spring where I was soon drunk by a fawn. Fellow raindrops landed onto that same forest watershed. They trickled down the hillside and helped replenish a clear lake, and still other drops were taken up by trees and plants and transpired into the atmosphere.

My next experience was different. I fell into a tobacco field. I struck the hard, bare earth, and boy, what an impact! I imagine it would be like a human being falling off the Empire State Building and hitting 5th Avenue flat on his face! I struck with such force that I dislodged many soil particles and became very dirty.



I began flowing with my fellow raindrops and we united to form a strong and angry team running down the hillside. Nothing was there to stop us! The faster we flowed, the stronger we became and the more earth we moved (and being filled with soil particles was very uncomfortable!). Together, we carried nearly a ton of topsoil into the river below, making it very muddy. I could hear fish and other living things crying for help as they were choked by the sediment.

My next cycle, I fell in a cornfield and again landed on the soil. This time, however, my experience was much better because the surface contained organic residue, which helped absorb the shock of my fall. I didn't dislodge many soil particles nor flow far before I was absorbed into the soil. A grassed waterway safely and cleanly stopped some of my fellow raindrops from flowing away. The next day I was taken up by the nearest corn plant and helped form the sweet juice of a kernel. Before long I was eaten and enjoyed by a human just like you.



The last time I fell to earth, I landed in a reservoir destined for "human consumption." I felt disappointed when, after much preparation of being cleaned and piped and pumped a long distance, I came out a leaky faucet and went straight down the drain unused. What a waste!

As an active raindrop, I felt I was important because I affected the earth and all living things in so many ways. Without water, nothing could survive! Humans seem to be in control of much of the earth's surface nowadays, so I feel it is up to you to take good care of us raindrops and other forms of water we make. As for myself, the last time I rose into the atmosphere I crystallized into a snowflake, so I decided to go north where I'm now happily retired inside a glacier. Who knows, maybe someday I'll be reborn.

4. Ask for questions and briefly discuss.
5. Pass out copies of Worksheet 1. Read the paragraph together. Have students complete individually then reread the paragraph and check together.

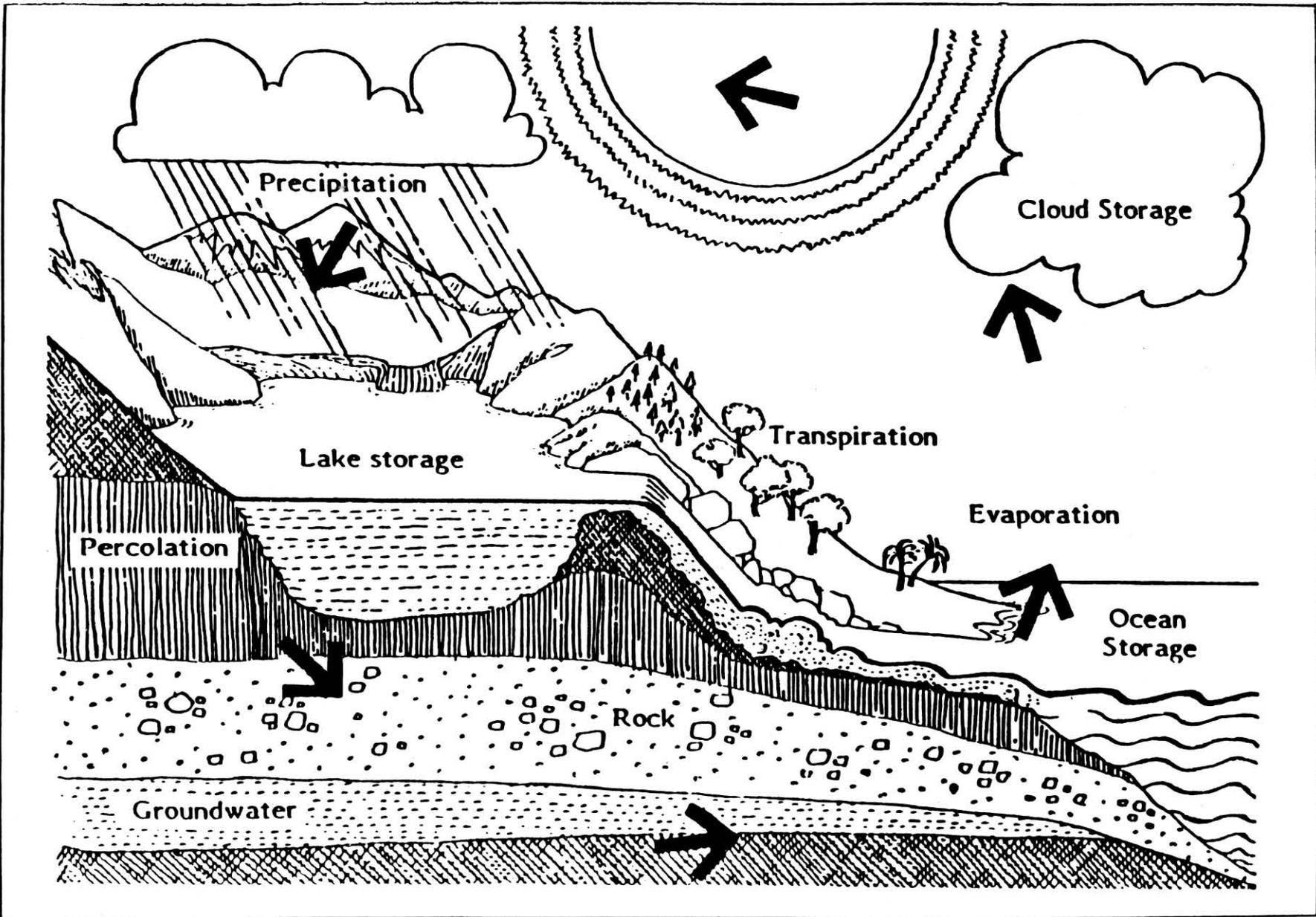
6. Pass out copies of Worksheet 2. Have students complete it in pairs. Check together.
7. Pass out copies of Activity Sheet 2 and Worksheet 3. Have students complete it in pairs.

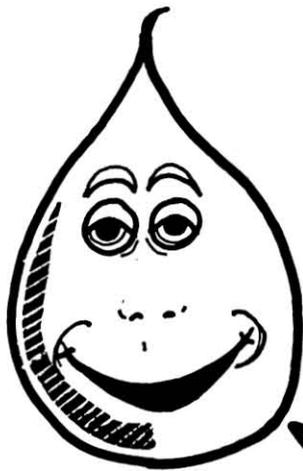
**Additional  
Activities:**

1. Worksheets 4 and 5.

**Adapted  
From:**

1. Soil Conservation Topics Education Kit
2. Conservation for Children
3. The Story of Drinking Water
4. Ecology and Energy Action Pack  
McDonald's Corporation



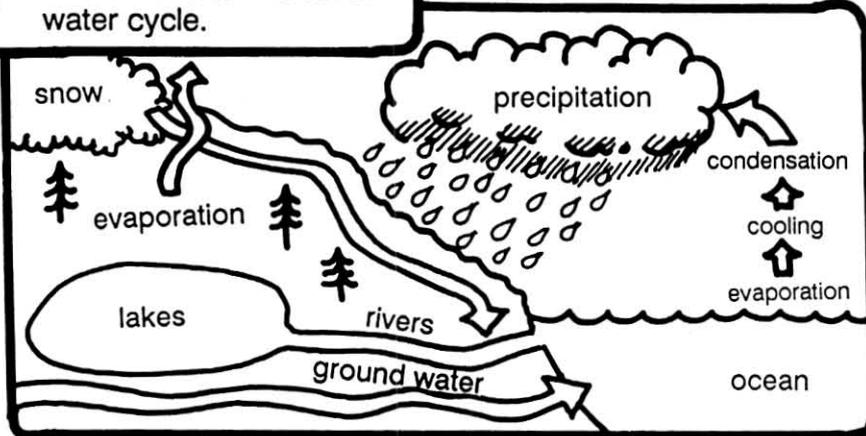


# Hi! I'm DRIP the water drop

I've been on the earth a long time. Years ago dinosaurs drank me...and you might have drunk me yesterday. Tomorrow no one will be able to drink me unless you keep me from being polluted.

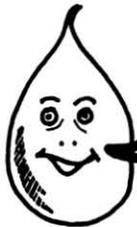
In case you didn't know this is where I usually live—in the natural water cycle.

Sometimes I'm borrowed from the natural water cycle and used by you. Do you know how I get from the cycle to your home?



Sure I come from a pipe. But before I was in the pipe I was drawn from a *river, reservoir, well, lake or ocean*. And on the way to your home I am usually cleaned at a purifying plant.

Others borrow me from the natural water cycle too. Here are some. Can you think of others?



What would they want me for? Listen to this!



It takes 150 gallons of water to make the paper for one Sunday newspaper...

It's nice to be needed by so many people... but being popular is a problem . . . for you and for me.

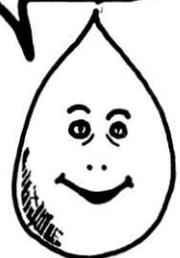
... .650 gallons of water to make the steel for one bicycle. . .



... .75 gallons of irrigation water to grow just one ear of corn. . .



... .and 200 gallons of water to make the rubber for one car tire.

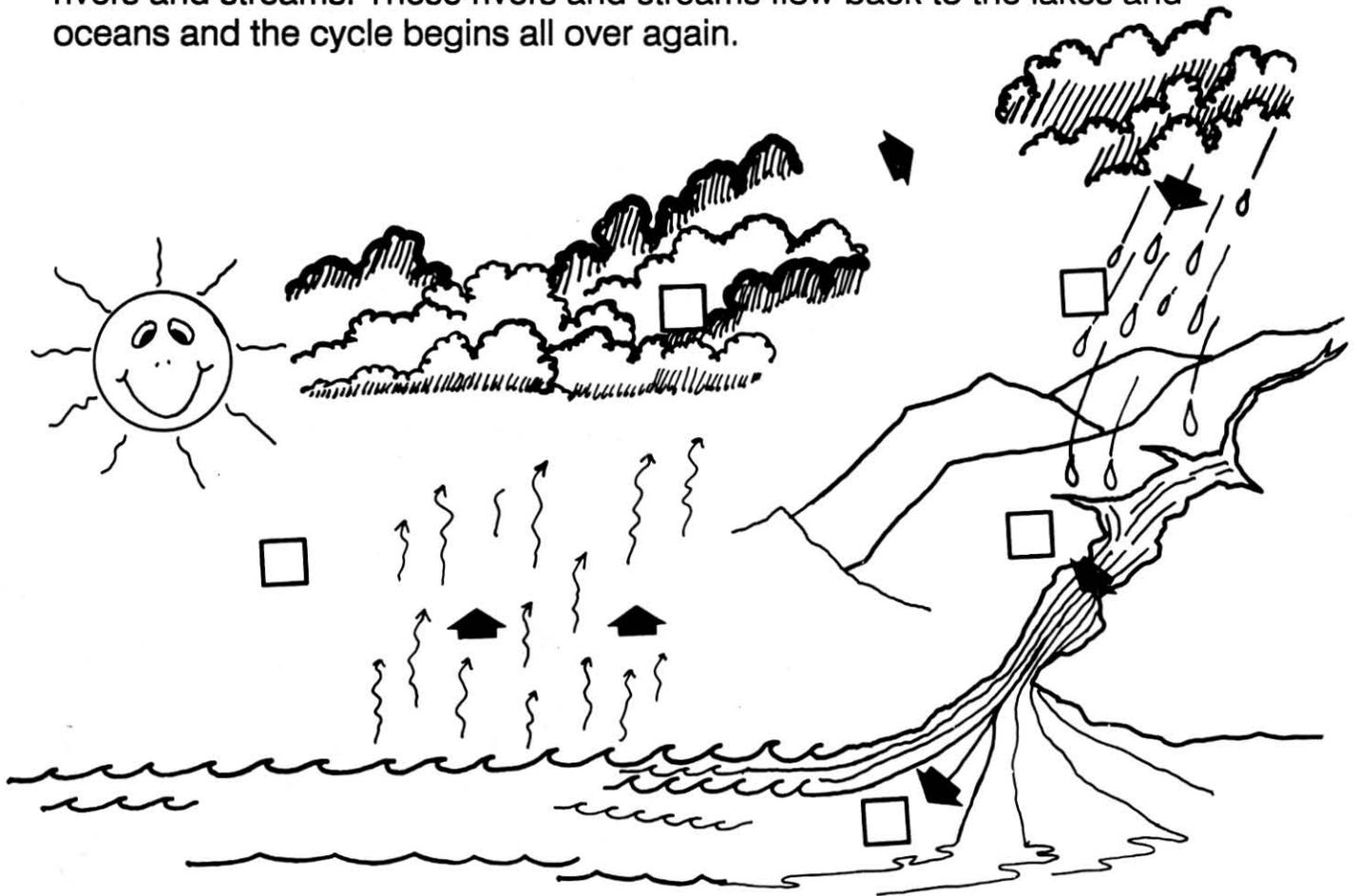




## The Water Cycle

A cycle is a circle of events that happen over and over again in the same order. Here is how nature's water cycle works.

Solar energy (heat from the sun) evaporates the waters from oceans and lakes. This water becomes water vapor as it rises in the air. The water vapor gathers together to become clouds. As the clouds get bigger and heavier, they cool and turn into rain. When it rains, the water runs into rivers and streams. These rivers and streams flow back to the lakes and oceans and the cycle begins all over again.



Put these numbers on the part of the picture that shows what is happening.

1. The sun's energy evaporates the water.
2. The water vapor gathers into clouds.
3. The clouds cool and rain begins.
4. Rain runs into rivers and streams.
5. The rivers and streams flow back to the ocean and lakes.

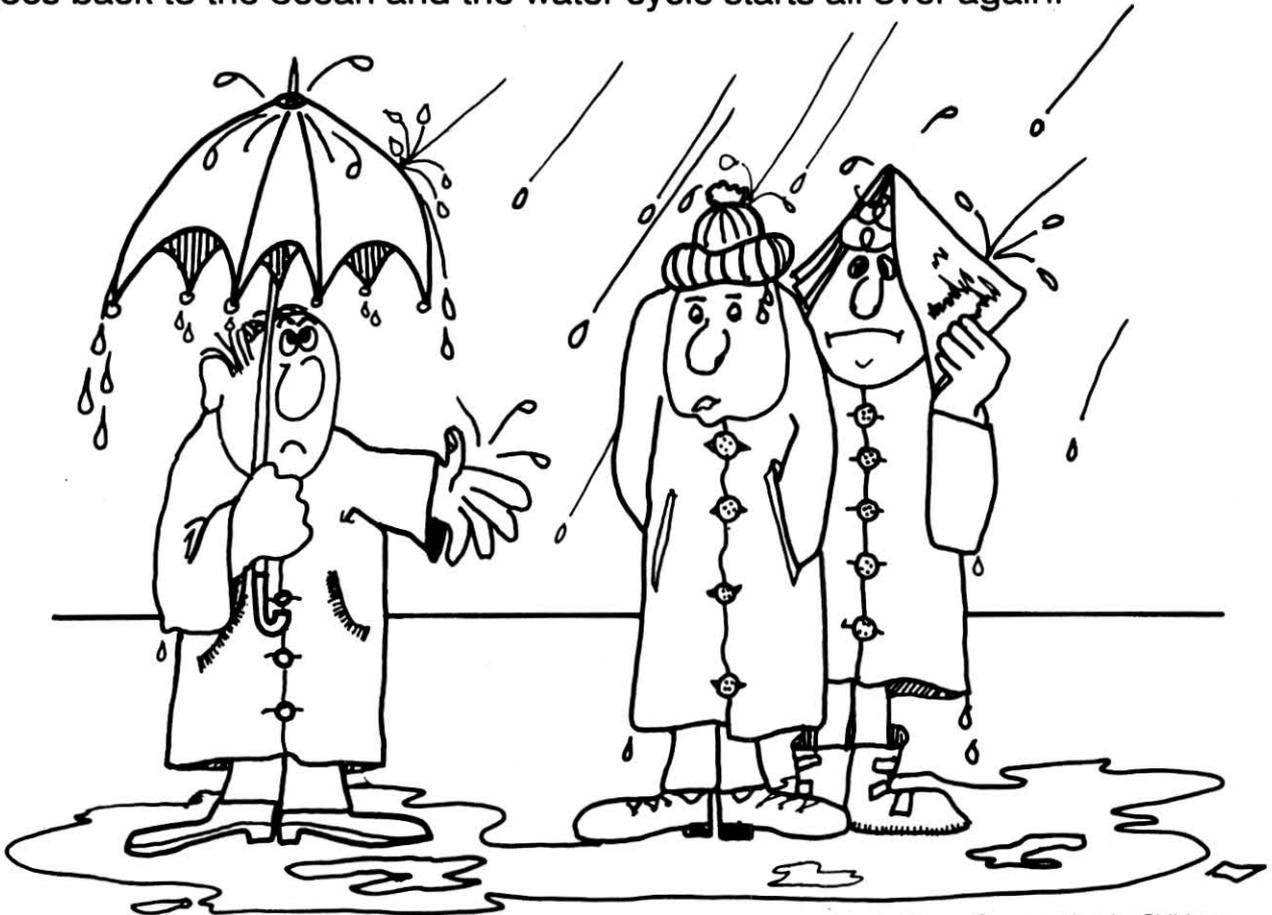
Name \_\_\_\_\_ 

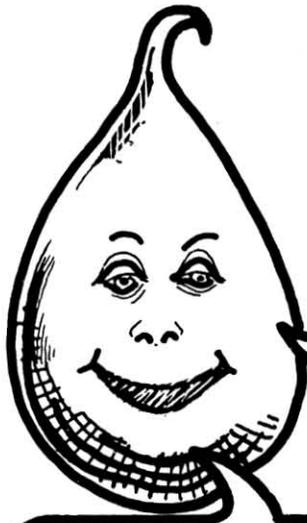
**Directions:** Use these words to fill in the blanks in the story.

clouds                  drink                  oceans                  sun  
rain                      rivers                  sewers

### The Water Cycle

Most of the water on the earth is in the \_\_\_\_\_. The water is salty there. Every day, the \_\_\_\_\_ shines on the water and heats it up. Some water evaporates and becomes \_\_\_\_\_. These move over the land and fall as \_\_\_\_\_ and snow. The water runs over the land and into \_\_\_\_\_. People can use this fresh water to \_\_\_\_\_, wash and grow plants. After the people use the water, some of it goes into \_\_\_\_\_. Then the water goes back to the ocean and the water cycle starts all over again.





The problem is this. After I'm used I have to go back to the natural water cycle where nature has its own ways of cleaning me.

But I'm getting so dirty today that nature needs a lot of help!

It can get that help from a sewer treatment plant where I'm often sent before I get back into the natural water cycle.

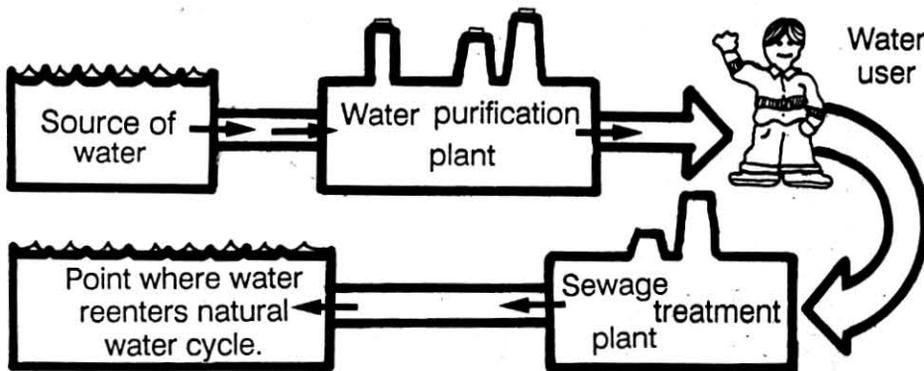
Even that's not as easy as it sounds. If too much of me has to be cleaned the plant may not bother with me. . . or may not do a very good job.



I said I need your help. You can give it by:  
 1. Not using more of me than you need. Then I won't have to be cleaned so often.  
 2. Keeping me clean in every way you can.

## Where does your water come from... Where does it go?

Study the diagram below. Then see if you can answer the questions that follow it.

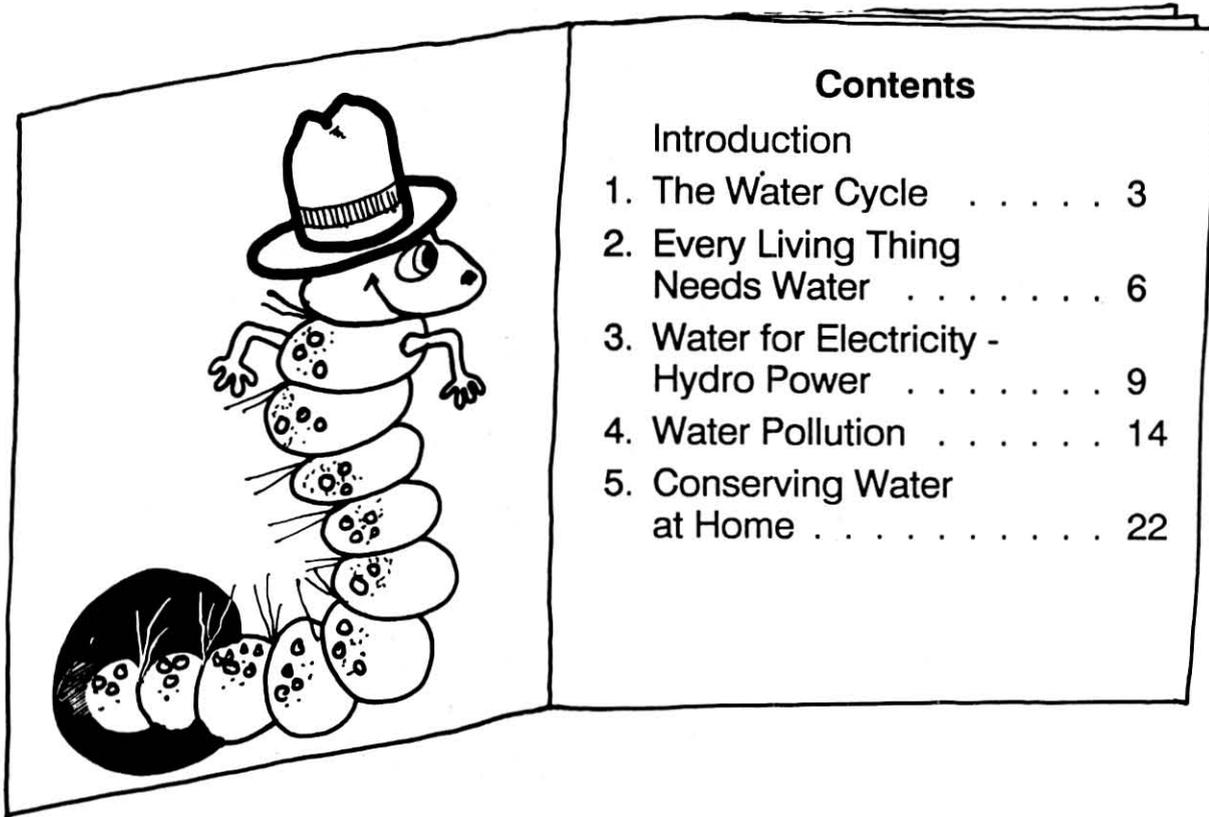


- Do you know the source of the water you use at home?
- Is your water purified *before* you use it? *After* you use it?
- Do you know where this purification takes place?
- Do you know where the water you use reenters the natural water cycle?





**Directions:** Use the Table of Contents to answer the questions.



1. To find out that we cannot live without water, you should look on page \_\_\_\_\_.
2. The chapter about the water cycle begins on page \_\_\_\_\_.
3. Ways of saving water begin on page \_\_\_\_\_.
4. The problems of dirty water start on page \_\_\_\_\_.
5. How we use water to light our homes will begin on page \_\_\_\_\_.
6. Fixing faucets that drip and taking short showers will begin on page \_\_\_\_\_.



**Directions:** Read each story. Choose the best title and draw a line under it.

Water is our most important natural resource. All plants and animals need water to live. Man could not live more than 4 or 5 days without water.

Our Natural Resources  
Plants and Animals are Alike  
Water is Important

Most of our water today is used for growing plants and animals for food. In our homes we use water to drink, cook our food and to bathe. We also use water for fun when we swim, go fishing or boating.

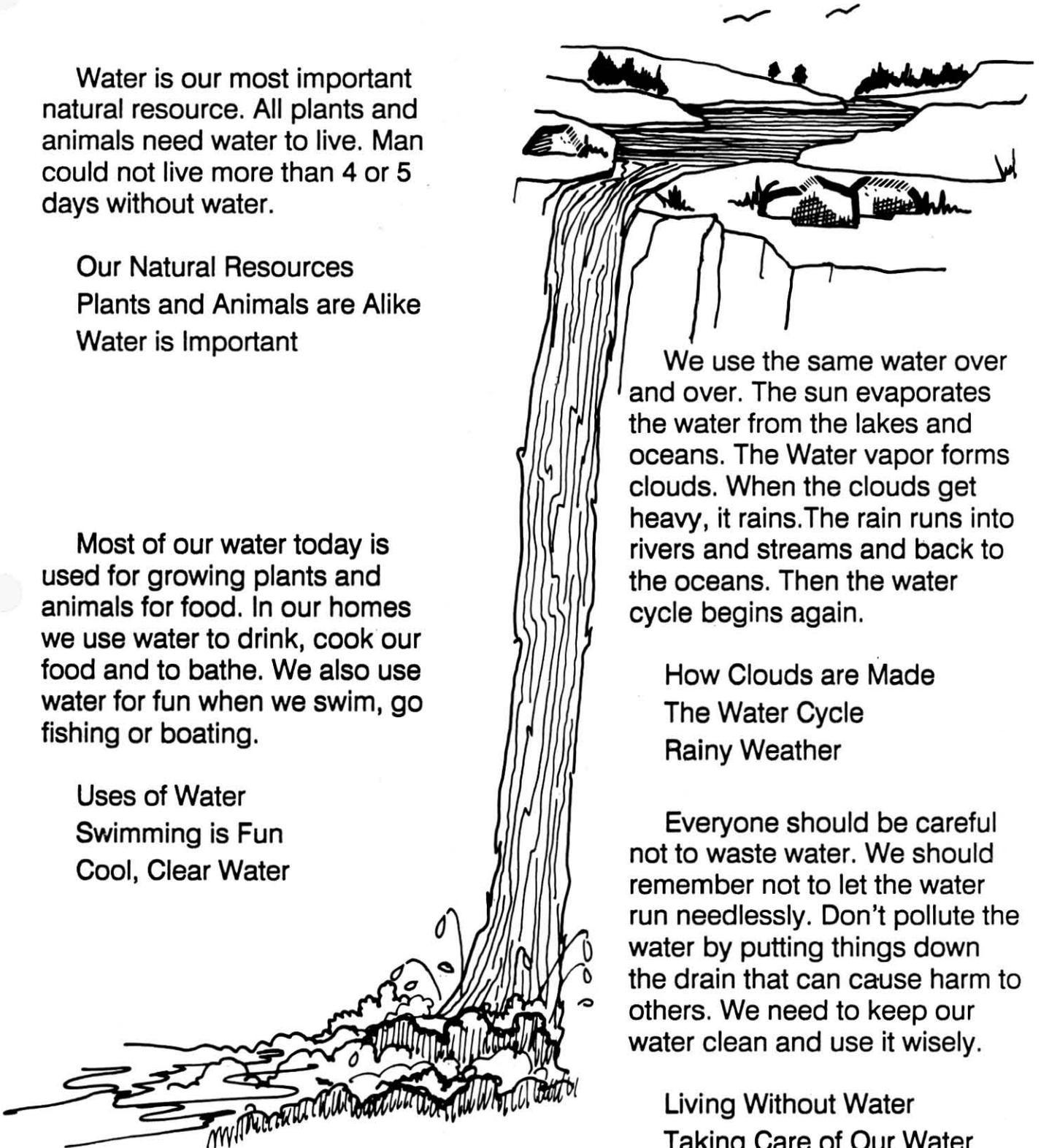
Uses of Water  
Swimming is Fun  
Cool, Clear Water

We use the same water over and over. The sun evaporates the water from the lakes and oceans. The Water vapor forms clouds. When the clouds get heavy, it rains. The rain runs into rivers and streams and back to the oceans. Then the water cycle begins again.

How Clouds are Made  
The Water Cycle  
Rainy Weather

Everyone should be careful not to waste water. We should remember not to let the water run needlessly. Don't pollute the water by putting things down the drain that can cause harm to others. We need to keep our water clean and use it wisely.

Living Without Water  
Taking Care of Our Water  
Our Polluted Rivers



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# Activity 17

## Water Conservation

### What's Wrong with the Water



**Subject Area:** Science

- Objectives:**
1. The students will understand ways water becomes polluted.
  2. The students will illustrate water conservation through a poster.

**Suggested Grade Level:** 3-4

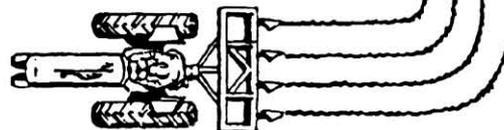
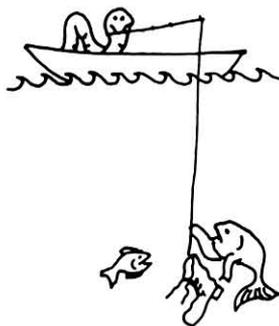
**Background:** Use a U.S. map to show location of the Great Lakes. A few years ago, beaches on the Great Lakes were declared unsafe for swimming. Tons of fish from those same lakes and the oceans were withdrawn from sale because of contamination. A number of cities found that their drinking water supplies were in danger. Of the world's drinking water 90% comes from groundwater sources. Perhaps most serious, water pollution appeared to be affecting the earth's life-sustaining food cycle.

Our entire way of life contributed to water pollution-factories dumped wastes into rivers, cities discharged sewage into rivers and lakes, homeowners used appliances like clothes washers and automatic dishwashers that flushed detergents into rivers and lakes. Farmers over used chemicals and they have migrated into our groundwater in some areas.

While in the United States water pollution is still very serious, people and their government are encouraging progress. Following clean-water legislation, many companies are finding ways to cleanse water from their manufacturing operations before returning it to rivers and lakes. Others are reducing water contamination by recycling the water they use. Farmers are being educated and are using better practices to apply needed chemicals to their crops.

Between 1961 and 1974, water pollution at 87 locations was measured by the government. During those years, locations falling into the "very poor" and "severe" categories in regard to conditions affecting aquatic life (fish) dropped from 16% to 3% and , in relation to drinking water safety, from 10% to 1 %. That means that the very worst sources of water pollution are beginning to be controlled.

Some serious problems remain. The building and maintenance of adequate water and sewage treatment facilities will require billions of dollars in the



years ahead. High levels of nitrogen and phosphorous in water continue to reduce oxygen and thus endanger water life in inland lakes. As late as 1975, the sale of some Great Lakes fish was still discouraged because of contaminants.

**Materials:**

1. Two glass jars
2. Alcohol or liquid soap
3. Water
4. Attached story
5. Construction paper
6. 1-2 qts of soil
7. Old 13x9x2 cake pan
8. Sprinkling can
9. Worksheet 1



**Procedure:**

1. Have students brainstorm ways water becomes polluted.
2. To demonstrate pollution from waste, fill two glass jars with clean water. Put some alcohol or liquid soap into one of the jars. Have each student smell/observe each jar. Which one of these would you want to drink? Which one would wildlife want to drink? Which one would be a healthy environment for fish? Which one has no use for human or animal consumption? Which one is polluted?
3. Demonstrate polluted water from eroded soil. Prepare a small model hill by making a mound of soil on the cake pan. When all the children understand that the mound represents a real hill and the sprinkling can will simulate rain, pour water gently from the sprinkling can over the mound of soil. Then simulate a harder rain.
4. What happened to the soil? (It washed to the bottom of the hill.) When does the water "walk" down the mound of soil? When does the water "run" down the mound of soil? What could be done to prevent the soil from washing away when it rains. (Terraces, plants, trees). Why did the soil wash into the water? (there was nothing on the hill to hold the soil back like plant roots or terraces.) How would the fish react to soil pouring into their pond? (The cloudy water would hide their food. The soil will fill up the pond eventually force the fish out of his home. The pond would disappear. This is called silting. Can fish get rid of the soil? (No, they have no way of getting it out of their house).
5. Read the short story "The Fish Say, Keep Soil Out of the Water".



## "The Fish Say, Keep Soil Out of the Water"



By John A. Dille, Soil Conservationist  
USDA, Soil Conservation Service

All fish would probably agree that they usually don't have anything against soil. In fact, it's part of the natural environment just like water in which fish live. But when soil washes into water where fish make their homes, it becomes their enemy.

When soil is worn off the land's surface by the action of wind and water, it's called soil erosion. Then when loosened soil particles are carried downhill into a lake or stream, the soil is called sediment. If we could go below the surface of a muddy farm pond and talk with one of the largemouth bass, bluegill or other fish, what reasons could they give for disliking soil that erodes off land and washes into their waters?

Well, a little soil wouldn't be too bad, but they just can't put up with the large amount they're getting. Sediment builds up in layers on bottoms of rivers, lakes and ponds. After this happens, the fishes' home in the water, their habitat, becomes smaller and smaller. Soon the fish haven't enough room and some will die. The fingerlings (baby fish) can't hatch because sediment covers and kills the eggs.

Tiny plant life that provides food for the fish doesn't grow so well when water becomes muddy with sediment. As a result not enough food is available. Fish also need dissolved oxygen in their waters to live and grow. Muddy water makes the oxygen level too low. Fish have good reasons to dislike soil in their waters!



Understanding the fishes' feelings is easy, because when soil gets into our own homes we call it dirt. We want to keep it outside and in its place. We keep our homes clean by sweeping, cleaning and wiping our shoes. But fish can't do anything to prevent their waters from getting too muddy. The government of the United States has set up the Soil Conservation Service to help. Its job since 1935 has been to reduce soil erosion which occurs when our nation's farmland, and other land, is left unprotected.

Fish are glad for this help but we also want to protect our soil and water so we can continue to grow an abundance of food and have plenty of clean water.

6. This is one form of pollution. Can you think of other causes of pollution?
7. Have each student make a poster to promote water conservation and discourage water pollution.

8. Complete Worksheet 1.

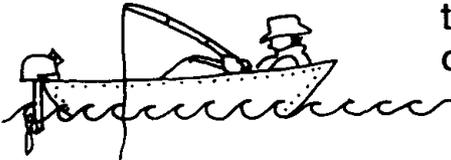
**Additional  
Activities:**

1. Have students complete the three page study guide using their reading skills.
2. Using page 1 (vocabulary) of the three page guide write all the vocabulary terms on colored cards. On different colored strips write the definitions. Give each student one card or strip. Give them 30 seconds to silently walk around the room to find the match for what they are holding.

**Adapted  
From:**

1. Conservation for Children
2. Teaching Soil and Water Conservation

**Directions:** Use the words in the box to fill in the blanks in the story. Read the story again to answer the questions at the bottom of the page.



conservation	deep	threatened
solve	sediment	trout
state	prevent	recreation

## Long Pine Creek



The Long Pine Creek is the longest self-supporting trout stream in the \_\_\_\_\_ of Nebraska. The trout are being \_\_\_\_\_ of losing their home in Lone Pine Creek. Farmers have not been using \_\_\_\_\_ practices to protect the soil and keep it on the land. The soil had been eroding into the creek causing increased \_\_\_\_\_ to settle on the bottom of the creek. Now Long Pine Creek is not as \_\_\_\_\_ as it once was. this change has affected the future of \_\_\_\_\_ in Long Pine Creek as well as \_\_\_\_\_ for people. People are working to \_\_\_\_\_ this problem. Can we \_\_\_\_\_ this from happening in other places?

### Answer the following questions:

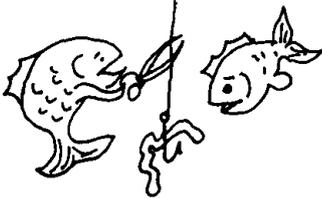
Who could lose their home in Long Pine Creek? \_\_\_\_\_

How can farmers keep the soil on the land? \_\_\_\_\_  
\_\_\_\_\_

What is settling at the bottom of Long Pine Creek? \_\_\_\_\_  
\_\_\_\_\_

Can we prevent this from happening in other places? \_\_\_\_\_

How? \_\_\_\_\_



## Vocabulary

1. **Pollution:** Anything that spoils the environment  
**Pollute:** To make dirty.
2. **Conservation:** Protecting from loss or being used up; avoiding waste.
3. **Sewage:** Waste materials that travel in sewers.  
**Sewers:** An underground drain to carry off waste water and refuse.
4. **Chlorine:** A chemical that is added to water to help clean it.
5. **Pesticide:** A poisonous chemical used to kill insect pests.
6. **Biodegradable:** Matter which is able to be broken down into usable substances.
7. **Smog:** A mixture of gases, smoke and moisture that pollutes the air.
8. **Carbon Monoxide:** A deadly poisonous gas in the exhaust fumes from cars.
9. **Filters:** A device used to clean water or air by removal of impurities.
10. **Waste:** Anything trown away as yseless or worthless; garbage is waste.
11. **Recycle:** To use materials again.
12. **Sanitary Landfill:** A place where trash is buried.

## Water Pollution/Water Conservation



Some years ago, all of our water sources were clean and safe to drink. That was before the Industrial Revolution led to the growth of large cities and factories. Now, concern has arisen because many of our rivers, lakes and streams have become polluted. What pollutes the water?

Sewage is one cause of water pollution. Wastes from our sinks and toilets run into sewers, or underground pipes. The waste materials that travel in sewers are sewage. In some cities, sewage flows into nearby streams and rivers. It kills fish and plants. The water in these streams and rivers is not safe to drink. Some cities along the ocean throw their trash and garbage into the ocean. This damages important fishing areas.

Chemicals are another source of water pollution. Factories have many kinds of liquid waste, such as oil, gasoline and chemicals. Liquid chemicals are sometimes dumped into streams. Some chemicals, such as pesticides are poisonous. These pesticides are used to kill insects, but will also kill fish when they get into the water. The fish that do live are not safe to eat. Is the water we drink clean and safe?

In many cities, sewers lead to a sewage treatment plant. This is a place where harmful wastes are taken out of the water. Chlorine kills germs. Water that is treated with chlorine is safe to use. Chemicals and air help to clean the water. Then it is safe for the water to return to the lakes, streams or oceans. What other things pollute the water? What can people do to help keep our water clean and safe?

Word Bank			
sewers	poisons	chlorine	smog
pollute	carbon monoxide	sewage	filters
sewage treatment plants	hot	trash	water

Use words from the Word Bank to complete each sentence below.

1. Your environment is made up of soil, air and \_\_\_\_\_.
2. A dangerous pollutant in the exhaust of cars is the gas \_\_\_\_\_.
3. When sewage and waste flow into streams, they \_\_\_\_\_ the streams.
4. In many cities, liquid wastes run into underground pipes called \_\_\_\_\_.
5. Pesticides pollute the water because they are \_\_\_\_\_.
6. Many cities build \_\_\_\_\_ to clean their water.
7. A chemical that kills germs is called \_\_\_\_\_.
8. Special \_\_\_\_\_ placed inside smokestacks can help keep the air clean.

## Activity 18 Water Conservation Forest in a Jar



**Subject Area:** Science

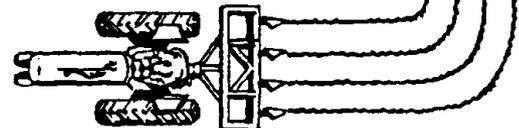
- Objectives:**
1. The students will be able to observe and describe succession.
  2. The students will be able to summarize what they have learned about how environments can change.

**Suggested  
Grade Level:** 3-4

**Background:** Succession is a term used to describe the ever- changing environment and the gradual process by which one habitat is replaced by another. Many habitats that appear to be stable are changing before us. In this activity, students will be able to see in miniature how a swampy area can be succeeded by a forested habitat. The major purpose of this activity is for students to recognize the process of succession.

- Materials:**
1. Pint or quart jars (one per student or per small group or one for the entire class).
  2. Water
  3. Soil
  4. Aquatic plants (one per jar), obtain from pond, lake or any wet area
  5. Two cups bird seed

- Procedure:**
1. To make a miniature swamp, place two inches of soil and three inches of water in a jar. Place the jar at a window, without a lid, and allow it to settle overnight.
  2. Plant an aquatic plant in the jar. It should grow well in this environment. If your classroom has no windows, substitute a grow- light.
  3. Do not replace the water that evaporates from the jar.
  4. Once or twice a week, have students add three or four bird seeds to the jar. While there is water in the jar, the seeds should germinate and then rot. Continue adding seeds even after the water evaporates.
  5. As the water evaporates down to the soil, the aquatic plant will die. The bird seeds will now find the environment suitable for successful growth.



Sunflower seeds, which grow large, can be added to represent forest trees. You will now need to add water, as a substitute for rainfall, to keep the soil damp for growing things.

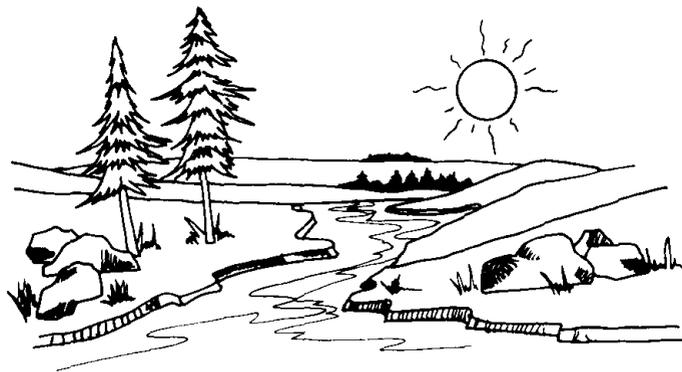
6. Have each student make a poster, drawing or other visual representation of what they saw happen to their "pond". Ask them to talk about what they have learned, how environments can change. Introduce the term, "succession". Describe three changes you saw happen to what was inside the jar.
7. Complete Worksheet 1 for reinforcement of the objectives.

**Additional  
Activity:**

1. Take a field trip to a pond. What plants are growing in the water? What plants are growing on the shore? What parallels are there between this real pond and the "pond" in the jar? Make a second drawing of this real pond. Compare the similarities and differences between the two.

**Adapted  
From:**

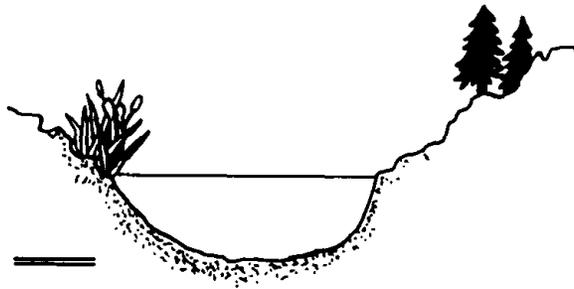
1. Project WILD



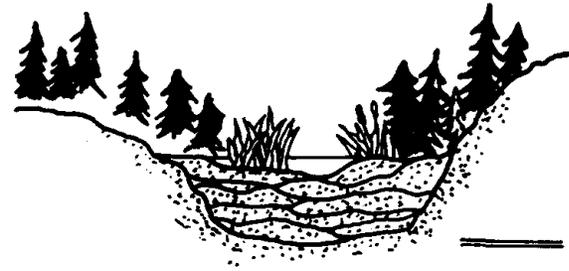
Name \_\_\_\_\_

**Directions:** On each line, number the drawings to show their order from first to last. Then, draw lines from each animal name to the places where they would be most likely to live.

95



fish



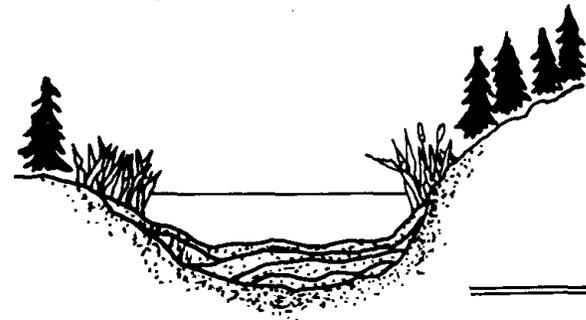
turtle

raccoon



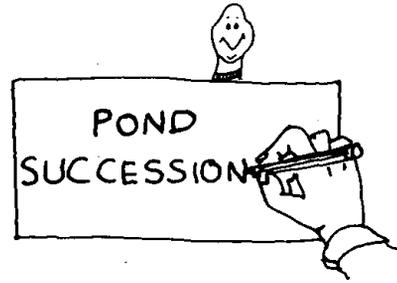
squirrel

deer



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## Activity 19 Water Conservation Pond Succession



**Subject Area:** Science, Language Arts, Art

- Objectives:**
1. The students will be able to recognize that natural environments are involved in a process of continual change.
  2. The students will be able to discuss the concept of succession.
  3. The students will be able to describe succession as an example of the process of change in natural environments.
  4. The students will be able to apply understanding of the concept of succession by drawing a series of pictures showing stages in pond succession.

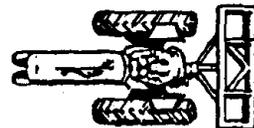
**Suggested  
Grade Level:** 3-4

**Background:** Succession is a term used to describe the everchanging environment and the gradual process by which one habitat is replaced by another. Many habitats that appear to be stable are changing before us - perhaps at a slow rate in human eyes, but evolving rather quickly according to the earth's clock.

For example, a shallow pond may be transformed into a marshy, then forested, area in only a thousand years or so. Wind-blown or water-borne spores of algae are the first inhabitants. Eggs of flying insects are deposited. Small fish and amphibians arrive through the inlet. Surrounding sediments begin to fill the pond, some born on wash-out from rainfall, some entering through the pond's inlet. Marshy plants growing along the shoreline spread inward as sediments fill the pond. Land plants also spread inward and replace the marsh plants as the ground is consolidated. As more plants and animals enter the system, more opportunities for habitat become available to others. Changes from ponds to forest are only one example of succession.

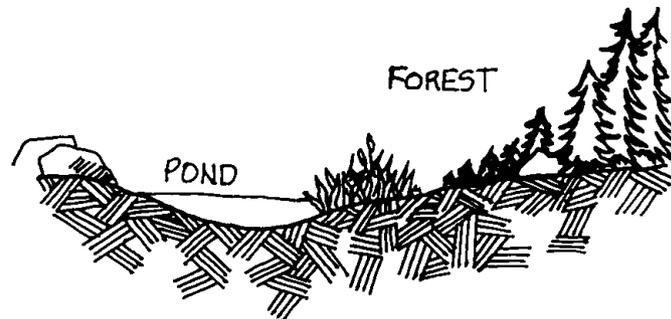
The major purpose of this activity is for students to discover that the environments is not static, but changing, and to see an example of how these changes progress over time, through experience with the concept of succession.

- Materials:**
1. Long pieces of drawing paper for murals
  2. Tape for securing paper to walls
  3. Crayons

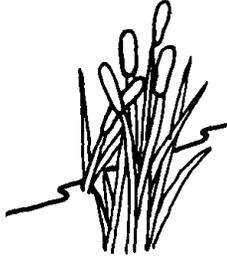


**Procedure:**

1. Review with students the idea of succession the orderly, gradual and continual replacement of one community of plants and animals with another.
2. Start by talking about a pond. How many people have seen a pond? What did it look like? After a description of ponds, ask the students to imagine what a pond would look like from a side view if you could see under the water and show the nearby environment. For example:



3. Explain to the students that they will be drawing a series of three views of a pond over a time period of about 800 years. The first (left-hand) section will show the pond as it is today, the middle section-how it might look 500 years later, the third-how the pond could look in 800 years. (These time periods are approximate and can vary greatly).
4. Discuss with them the possibilities of plant and animal life in the first section. What kinds of plants and animals live: in the water; along the shoreline; in the surrounding area?
5. Then give each group their piece of paper which they will divide into three equal sections (by folding or drawing). Instruct them to fill in the first section with their drawing of the pond and surrounding area. Set a specific time frame for the students to draw (about ten minutes).
6. Bring the class together again for a discussion of the second section - to be labeled "500 Years Later". Consider the following items: What changes in the environment have taken place? How will the pond look now? What lives and grows in the water now that it is much shallower and smaller? What lives and grows around the shoreline - which is now marshier? (marsh animals and plants, perhaps some willow bushes) What lives and grows in the surrounding area? (larger trees, same types of animals) Have each group complete the second section of their mural, labeling it "500 Years Later".



7. Repeat the process for the third section, labeling it "800 Years Later" and discussing the following topics:
  - a. By this time the pond is almost totally filled with sediment, leaving only a small marshy area with perhaps a stream running through. What changes have taken place?
  - b. What lives and grows in the environment?
  - c. What lives and grows where the shoreline used to be? (bushes, small trees)
  - d. What effects does the pond succession have on the surrounding area? (different animals, trees requiring less water)
8. After the murals are completed, students should sign them. Then they may be displayed in the classroom for all students to see and discuss differences and similarities between the various murals. Ask the students to summarize what they have learned, including how succession is one example of the ongoing process of change in natural environments.

**Additional  
Activities:**

1. Use a stream table filled with standard soil to illustrate in three-dimensions, dynamic ways the processes of succession! Fill the table with the soil, make an indentation in the center to represent the pond; run water into the table to represent the pond; run water into the table to represent rainfall, streams feeding the pond, etc.; and watch the pond fill as sedimentation takes place. This can show the geologic life cycle of the pond. Add replicas of plants and animals during successional stages for even more interest!
2. Visit a pond, a marshy area, and a forest to show stages of succession.

**Adapted  
From:**

1. Project WILD

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## Activity 20 Tree Conservation Adopt a Tree for a Year



**Subject Area:** Science, Language Arts, Art

- Objectives:**
1. The students will develop an awareness of the parts of a tree.
  2. The students will be aware of the changes a tree goes through by observing and recording information on a tree for the entire school year.

**Suggested  
Grade Level:** 3-4

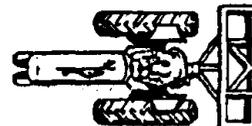
**Background:** Refer to "43 Trees of Nebraska" (Stop, Look and Learn, Volume #3, 5-6)

- Materials:**
1. "My Terrific Tree" booklet for each student (Attached Activity Sheets)
  2. Crayons
  3. An outside area with many trees
  4. Tape measure

**Procedure:** **Note:** This activity needs to begin at the beginning of the school year and continue until school is over in the spring.

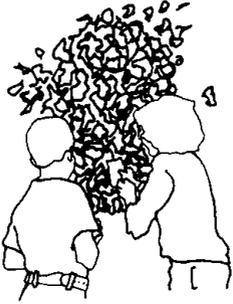


1. Explain to the class that they are about to make friends with a very important part of nature - a tree. Explain that there are two kinds of trees, evergreen and deciduous trees. The students need to focus on deciduous trees for this activity.
2. Pass out copies of My Terrific Tree. Go out into an area with many trees. Have each student "adopt" a deciduous tree. A tree may be adopted by more than one student. Ask students to explore their new friend without making any noise (Remember trees can't talk). Some ideas to explore the tree:
  - a. Reach as high as you can to discover how tall your friend is.
  - b. Touch the bottom of your friend, feel around its base.
  - c. Rub your cheek against the outer surface of your friend. Is it smooth or rough? What color is the bark?
  - d. Give your friend a big hug, reaching around it as far as possible.
  - e. Try to guess how old your friend might be. Do you think your friend has had an easy life or a hard life? What hardships might your friend have encountered?



- f. Listen to the wind as it blows through the leaves and branches.
- g. Smell the bark and a leaf from your friend.

3. Have the students fill out the front page of their tree booklet (Activity Sheet 1). Check 43 Trees of Nebraska to determine the type of tree.



4. Have students complete the Summer Appearance page (Activity Sheet 2).

- a. They should draw their friend as it looks now.
- b. Pull a leaf and then flatten it in the classroom and paste it in this area.
- c. Fill in today's date.
- d. Width - measure the trunk with a tape measure 1 yard above the ground.
- e. Using the remaining list, make observations and write yes or no.

5. The students should complete the pages for Fall, Winter, and Spring. Encourage neatness and accuracy. As they observe their tree throughout the year, notice -- when the leaves fall, damage from birds or insects, fruit, blooms, holes, small tunnels, fungus plants (looks like shelves, pieces of white bread, hard moss on branches), aphids (tiny green insects on leaves), lichens (flat plants on trunk - green or gray). Try to think of your friend as an apartment building. Who lives on the ground level? The upper level?

**Additional  
Activity:**

- 1. Worksheet 1

**Adapted  
From:**

- 1. Conservation for Children

# My Terrific Tree

Adopted by: \_\_\_\_\_

Adopted on: \_\_\_\_\_

Personal information about my tree.

Name \_\_\_\_\_

Type \_\_\_\_\_

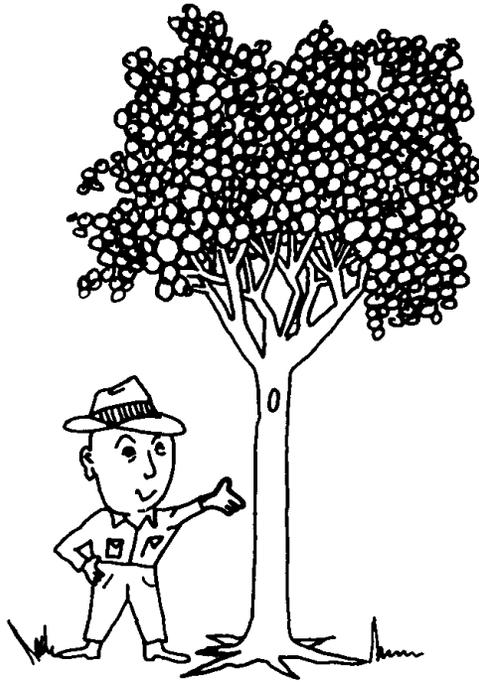
Skin Color \_\_\_\_\_

Location; \_\_\_\_\_ steps \_\_\_\_\_

of the \_\_\_\_\_

and \_\_\_\_\_ steps \_\_\_\_\_

of the \_\_\_\_\_



# Summer Appearance

Profile

Leaf Sample

Observations:

Date: \_\_\_\_\_

Trunk Size: \_\_\_\_\_ inches

Buds: \_\_\_\_\_

Flowers: \_\_\_\_\_

Fruit: \_\_\_\_\_

Nuts: \_\_\_\_\_

Nests: \_\_\_\_\_

Webs: \_\_\_\_\_

Insects: \_\_\_\_\_

Animals: \_\_\_\_\_

# Fall Appearance

Profile

Leaf Sample



105

Activity Sheet 3

Observations:

Date: \_\_\_\_\_

Trunk Size: \_\_\_\_\_ inches

Buds: \_\_\_\_\_

Flowers: \_\_\_\_\_

Fruit: \_\_\_\_\_

Nuts: \_\_\_\_\_

Nests: \_\_\_\_\_

Webs: \_\_\_\_\_

Insects: \_\_\_\_\_

Animals: \_\_\_\_\_

# Winter Appearance

Profile

Leaf Sample



Observations:

Date: \_\_\_\_\_

Trunk Size: \_\_\_\_\_ inches

Buds: \_\_\_\_\_

Flowers: \_\_\_\_\_

Fruit: \_\_\_\_\_

Nuts: \_\_\_\_\_

Nests: \_\_\_\_\_

Webs: \_\_\_\_\_

Insects: \_\_\_\_\_

Animals: \_\_\_\_\_



# Spring Appearance

Profile

Leaf Sample

Observations:

Date: \_\_\_\_\_

Trunk Size: \_\_\_\_\_ inches

Buds: \_\_\_\_\_

Flowers: \_\_\_\_\_

Fruit: \_\_\_\_\_

Nuts: \_\_\_\_\_

Nests: \_\_\_\_\_

Webs: \_\_\_\_\_

Insects: \_\_\_\_\_

Animals: \_\_\_\_\_



Trees are one of Nebraska's natural resources. Among the tallest trees in the world are the redwoods growing in Northern California and Southern Oregon. Nebraska has 781,282 acres of commercial forest land. Trees are important because they provide a renewable source of energy. By planning wisely we can grow new trees to replace the trees we use.

**Directions:** Use the code and your answers to the problems to solve the riddle.

**How can an elephant get to the top of a tree?**

Code Box

A	B	C	D	E	F	G	H	I	J	K	L	M
1	2	3	4	5	6	7	8	9	10	11	12	13
N	O	P	Q	R	S	T	U	V	W	X	Y	Z
14	15	16	17	18	19	20	21	22	23	24	25	26

38 <u>-19</u>	45 <u>-36</u>	53 <u>-33</u>

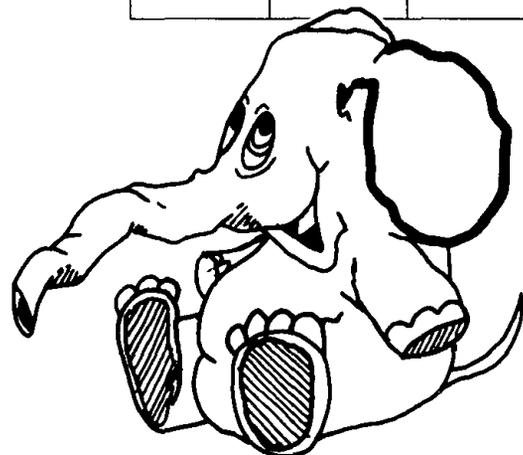
96 <u>-81</u>	73 <u>-59</u>

90 <u>-89</u>	29 <u>-15</u>

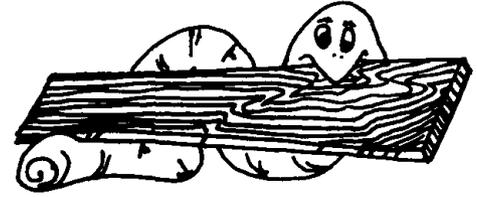
79 <u>-78</u>	70 <u>-67</u>	42 <u>-27</u>	44 <u>-26</u>	65 <u>-51</u>

60 <u>-59</u>	32 <u>-18</u>	51 <u>-47</u>

82 <u>-59</u>	80 <u>-79</u>	60 <u>-51</u>	72 <u>-52</u>



## Activity 21 Tree Conservation Uses of a Tree



**Subject Area:** Science, Language Arts, Math

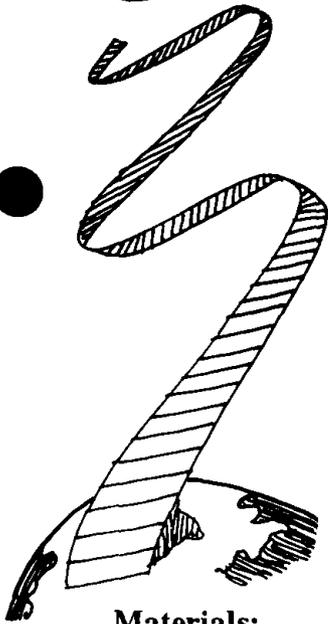
**Objective:** 1. The students will discover all the ways trees are used.

**Suggested  
Grade Level:** 3-4

**Background:** Trees can be used for: Homes for people and wildlife, food for people and wildlife, telephone poles, cover on a hill, medicines, paper, pencils, furniture, hammer handles, windbreaks, swings, decoration, shade, and rubber among other ways.



Wood is a universal material and no one has ever been able to make a satisfactory count of its many uses. About 36 billion board feet of lumber is used in the United States during an average year. Visualize a board walk 40 feet wide and one inch thick; imagine the boardwalk extends from where you stand three-fourths of the way to the moon. That's 36 billion board- feet!



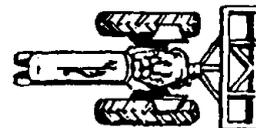
We also grow trees to help with soil and water conservation. There are millions of acres of land in the United States that are not suited to cultivation but that can grow trees. If this land were put into crops, the soil would soon wash away. The results would be floods, streams choked with silt, reservoirs filled with mud, and crop failure caused by lack of irrigation water. Steep land, rocky land, shallow soil, some wet land, some dry land, and many other lands and soil conditions are capable of growing of trees. If we had no other uses for trees other than to protect land not suited to grass or cultivated crops, that would be enough.

**Materials:**

1. Paper
2. Pencil
3. Worksheets 1-3

**Procedure:**

1. Look about the classroom to see how many things are made from trees, discuss.
2. Pass out Worksheet 1. Have students complete it and then check together. Ask what other uses of trees did they just read about? (peoples homes, homes for wild animals, food for wild animals.)



3. Pass out Worksheet 2. Have students fill in as many areas as possible. Discuss. Then discuss how these things can be reused or conserved. (ie. use both sides of paper, put fruit rinds and nut shells into mulch pile, redecorate old homes, use old boards for firewood, recover old chairs, recycle newspapers, etc.)
4. Have each student write two sentences about what he/she would miss the most if there were no trees. Collect and read them aloud to the class. The students need not put their names on the papers.

**Additional  
Activities:**



1. To make a classroom display of tree uses and things we get from trees. Have a student make a large outline of a tree on brown paper. Other students should draw and cut out leaves and on each leaf write down a use or gift from a tree. Hang the leaves on the trees.

2. "Paper Shopping Bags" :  
A long time ago there weren't any shopping bags. People brought their own reusable containers with them to the stores to bring home their purchases. Then in 1906 the first paper shopping bags were made. Now paper bags are used by all the stores. Three big paper companies make millions of paper bags every year.

There are lots of ways to recycle paper bags. You can use them again. Some stores will pay you three cents for every bag you return to use again. Other ways to recycle paper bags include - covering books, making litter bags, making a mask. You can probably think of lots of other ways to use paper bags.

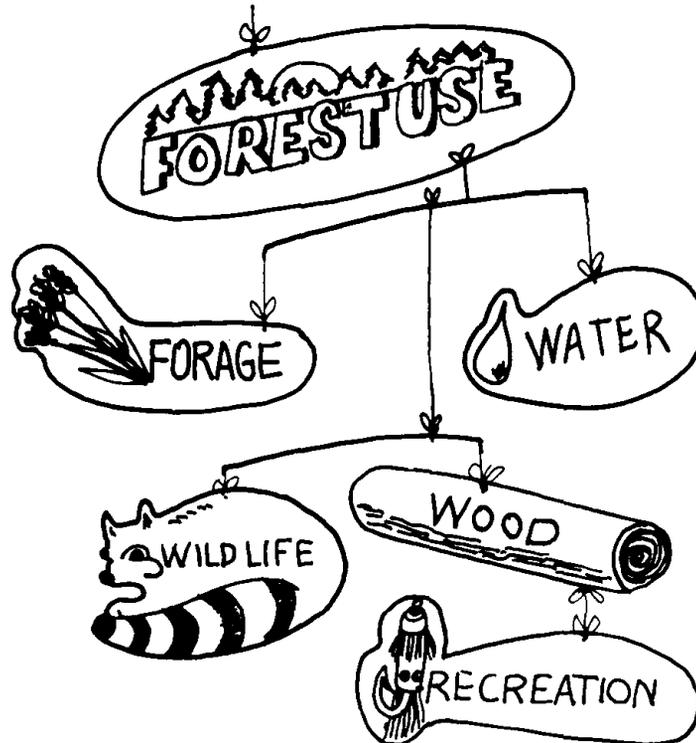
Here's how to make a mask.

1. Find a used bag big enough to comfortably go over your head.
  2. Cut out the spaces where your eyes will be able to look out from.
  3. Add hair, eyelashes, a nose, a mouth, ears, and whatever else you'd like.
3. Forest Conservation Mobile :  
Forest conservation means keeping the supply of forest resources in balance with the need for them. National forests are managed to get as many uses as possible from them without harm to any resource. The principle is to keep the several uses in balance with the supplies of the resources. Balances can be illustrated by mobiles.

1. Discuss what resources are in a forest (i.e. wildlife homes, food, etc.)
2. Construct mobile frameworks from wire coat hangers.
3. Place the word "forest" at the top of the mobile. Balance this with cards denoting forest resources and uses.
4. Worksheet 3.

Adapted  
From:

1. Conservation for Children



**Read the Story**

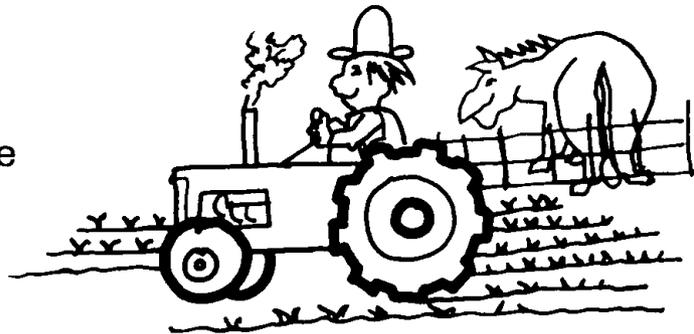
Once upon a time, there was plenty of room on Earth for all the plants, animals and people. They all shared their environments very nicely.



As years went by, there were more and more people. More people needed more homes. To build them, more trees were cut down. Wild animals also used the trees for homes. They had to move.



More people needed more food. To grow more food, more land was needed. The wild animals had less and less room and food. Soon there were fewer wild animals.



**Answer the Questions**

1. People cut down trees to build \_\_\_\_\_.
2. They needed more land to grow \_\_\_\_\_.
3. The wild animals had less and less \_\_\_\_\_ and \_\_\_\_\_.
4. There were fewer wild \_\_\_\_\_.



Name \_\_\_\_\_ 

**Directions:** Arrange each group of numbers in order (smallest to largest) to read the message.

52 87 60 2 16 99 8 37 63 21 11 29 79 46 58 81  
E I A T E L R A N S E W D T R O

Write the numbers on the line. Write the letter that goes with it underneath.

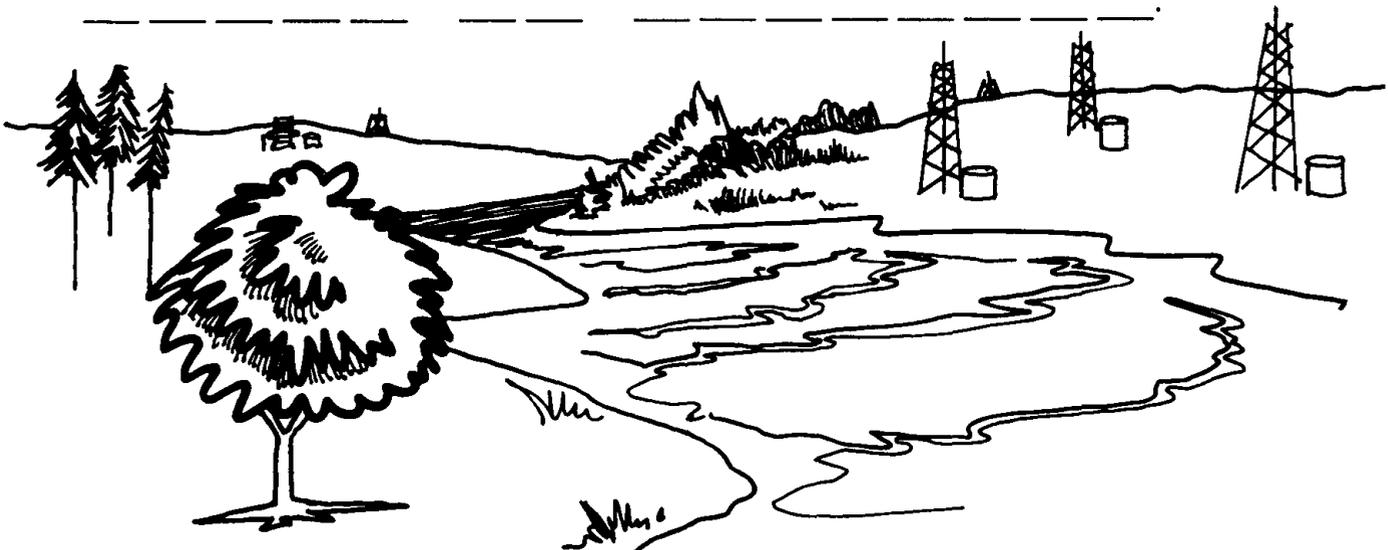
\_\_\_\_\_

162 196 170 100 119 193 180 179 182 105 155 112 143 167 126 139 138 150 181  
R S S A N E U O C R L E R E A U T A R

\_\_\_\_\_

521 413 311 864 200 374 287 723 226 598 600 899 241 789 790  
N N D K F I N R O E B A U A S

\_\_\_\_\_



## Activity 22 Tree Conservation Leaves are Important



**Subject Area:** Art, Science

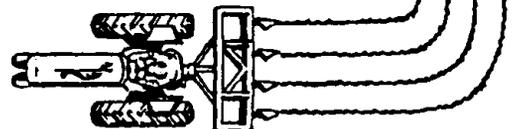
- Objectives:**
1. The students will understand how many ways the leaves on a tree provide help to other parts of nature.
  2. The students will make a leaf print.

**Suggested  
Grade Level:** 3-4

**Background:** 43 Trees of Nebraska Booklet (Stop, Look and Learn, Volume #3, 5-6)

- Materials:**
1. Plaster of paris
  2. Large leaves, sycamore, maple or fruitless mulberry
  3. Aluminum foil pie pan
  4. Paint
  5. Large mixing bowl

- Procedure:**
1. Take students out and have them sit under a shade tree.
  2. Give them 2-3 minutes of silent thinking time to generate ideas for how tree leaves help other parts of nature.
  3. Have a sharing session, ideas may include:
    - shade
    - windbreaks
    - cushion for raindrops hitting the ground
    - shelter for birds
    - food for animals
    - beauty
    - when they fall to the ground they'll decompose into organic matter to make the soil richer
  4. Return to the classroom and make leaves.
    - a. Mix Plaster of paris according to directions.
    - b. Pour into pans until the plaster is about 1/2" thick.
    - c. Place leaf, vein side down in plaster.
    - d. Let plaster dry shortly, until print will stay.
    - e. Carefully remove leaf. Let dry thoroughly. Remove from pan.



f. Paint if desired.

**Additional  
Activity:**

1. Have students bring in different leaf samples. Have them look up in "43 Trees of Nebraska" to find out what kind of leaf it is. Have them classify into large leaves, different colored leaves, leaves with different smells, different shapes, and different textures.



Activity 23  
Tree Conservation  
**Tree-mendous Math**



**Subject Area:** Math, Science

- Objectives:**
1. The students will correctly solve math word problems by adding, subtracting, multiplying, or dividing.
  2. The students will discover information about the Nebraska forest industry.
  3. The students will be able to correctly match a leaf with another of a given shape.

**Suggested  
Grade Level:** 3-4

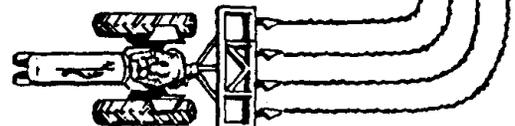
**Background:** Although Nebraska is the 15th largest state in total land area, less than two percent of its over 77,000 square miles is represented by commercial forest land. Rhode Island, Delaware and North Dakota are the only states having fewer acres of commercial forest land than Nebraska.

Nebraska's forests are unique. Its eastern hardwood forests mark the western boundary of the Central Hardwood Forest types. In western Nebraska, vegetation is representative of the Rocky Mountain region, with ponderosa pine occurring in large forested areas. These two major forest types converge in the Niobrara River Valley, the only such occurrence in the nation.

There are over 50 sawmills in Nebraska. These mills process about 25 million of the state's estimated annual harvest of 28.7 million board feet. The major products produced are pallets and crating materials. Primary processing provides about 230 man years of employment.

- Materials:**
1. Worksheets
  2. 43 Trees of Nebraska Booklet (included in Volume 3, Grades 5-6)

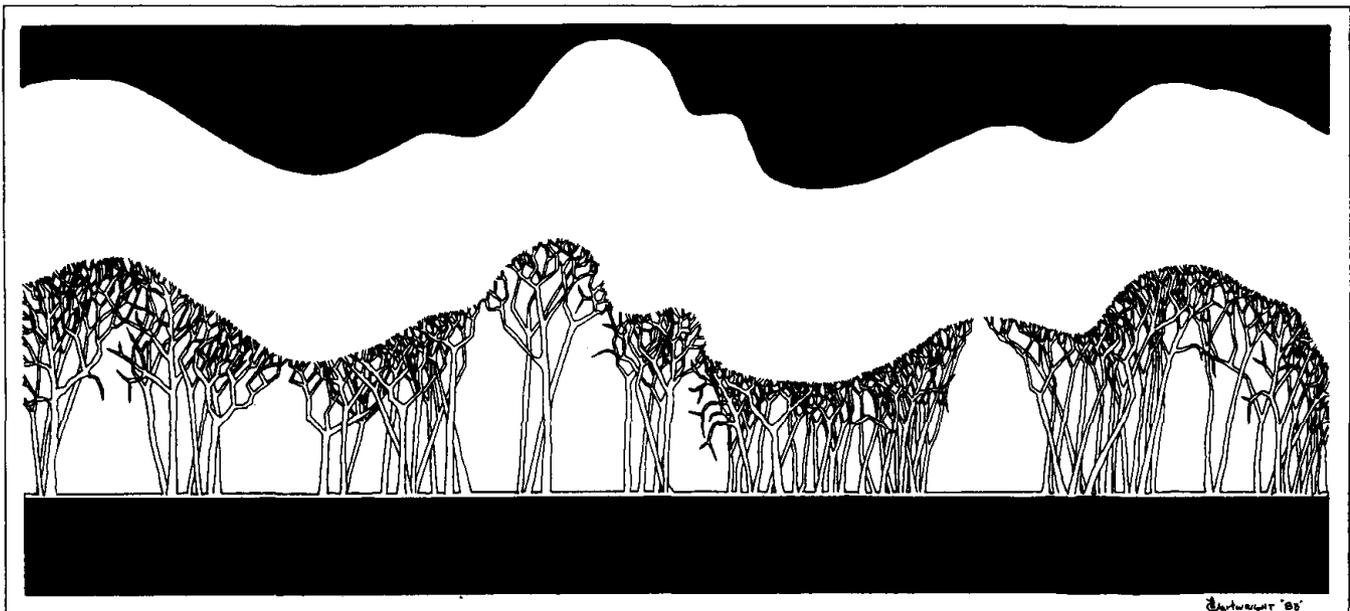
- Procedure:**
1. Divide the class into teams. Have each team collect leaves from each of a number of different kinds of trees. Try to use leaves on the ground. Avoid pulling leaves off of the tree.
  2. Talk about the shape of the leaves and the name of tree each leaf came from.
  3. Make a leaf pile for each team consisting of one leaf from each tree.



4. Place the piles a set distance in front of each team.
5. A leader calls the name of a tree and holds up its leaf, then says "Go".
6. The first student in each team runs to the pile of leaves and finds the leaf to match the leaf the leader is holding.
7. Each student that identifies the correct leaf gets a point. Return the leaf to their piles and repeat with the next student on the team until each student has had a chance to test his/her knowledge.
8. Discuss the trees that were used. What kinds of trees grew around their homes. These are Nebraska trees. Do you think Nebraska has any forests? Discuss Nebraska's forests.
9. Complete Worksheet 1 to discover more information about the Nebraska forest industry.

**Adapted  
From:**

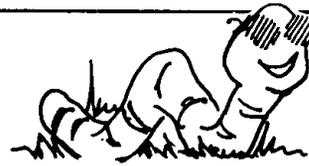
1. NEB Guide G82-561, Joseph Range, Extension Forester, Nebraska Cooperative Extension Service
2. Project Learning Tree



Name \_\_\_\_\_



## Tree - Mendous Math



1. Together Sue, Randy and Chris planted a total of 27 Pin Oak trees. If every student planted the same amount of Pin Oaks, how many trees did each student plant?
  
  
  
  
  
  
  
  
  
  
2. Tom, who farms near Grand Island, planted a windbreak on the north side of his farm. He planted 137 Red Cedars and 286 Rocky Mountain Junipers. How many trees did he plant in all?



3. Use the information from this chart to answer the questions.

Tree	Life Span in Eastern Nebraska
Scotch Pine	80 years
Ponderosa Pine	200 years
Colorado Blue Spruce	120 years

Use mental math to figure out the difference in life spans between these trees:

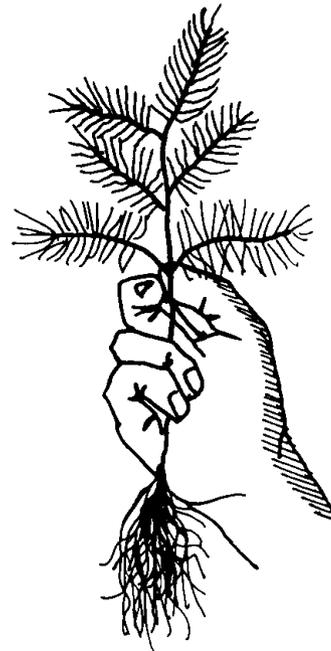
Colorado Blue Spruce and the Scotch Pine \_\_\_\_\_ years

Ponderosa Pine and the Scotch Pine \_\_\_\_\_ years

Ponderosa Pine and the Colorado Blue Spruce \_\_\_\_\_ years

4. This is a list of some Nebraska counties and their acres of commercial forest area.

<b>County</b>	<b>Acres</b>
Buffalo	9,288
Cherry	32,840
Cass	18,200
Dawes	62,180
Douglas	6,600
Hall	5,701
Lancaster	4,800
Lincoln	7,518
Madison	3,920
Sheridan	50,150

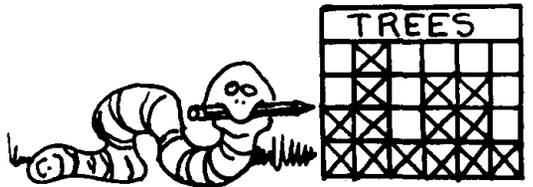


Answer these questions from the table above.

- A. Which county has the least amount of commercial forest area?  
\_\_\_\_\_
- B. Which county has the most commercial forest area? \_\_\_\_\_
- C. What is the difference between the commercial forest acres of Douglas and Cherry counties? \_\_\_\_\_
- D. Three times the size of the acres in Hall county would almost be as big as the forest acres of \_\_\_\_\_ county.
- E. What is the total of the commercial forest acres of Buffalo, Lancaster and Lincoln counties? \_\_\_\_\_
- F. Which county has the most acres, Sheridan or Dawes? \_\_\_\_\_



**Activity 24**  
**Tree Conservation**  
**Tree-mendous Graphs**



**Subject Area:** Math, Science

- Objectives:**
1. The students will complete a bar graph on the approximate life span of common Nebraska trees.
  2. The students will decide which zone he lives in from information given on a map.
  3. The students will find trees that are common in their area.

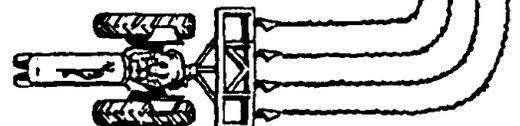
**Suggested  
Grade Level:** 3-4

- Materials:**
1. Graph paper
  2. Crayons
  3. Activity Sheets 1-4
  4. Worksheets

- Procedure:**
1. Pass out copies of the Activity Sheets. Discuss the names of trees and the approximate life spans. Help students to understand the zone map, Activity Sheet 2.
  2. Decide which trees are common in your area from information on Activity Sheets. Have students find the trees around their homes and school yard.
  3. Each student needs to make a bar graph for the conifer and the deciduous trees of their zone. The graph should contain:
    - The number of years on the left side of the graph.
    - The tree names across the bottom.
    - The title, "Approximate Life Span of Conifers or Deciduous Trees".
  4. Generate discussions after graphs are complete.

- Additional  
Activities:**
1. Worksheet 1, also have a cross section of a tree and count the rings.

- Adapted  
From:**
1. Conservation Education
  2. Conservation For Children

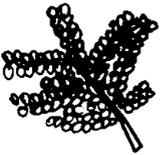




1. **Siberian Elm** (*Ulmus pumila*) is widely publicized and sold as "Chinese" elm. It is adapted to almost all soil and moisture conditions in the state, but is somewhat short lived. This tree is resistant to Dutch elm disease. The wood is brittle and breaks in wind, snow and ice storms. Other problems to expect are elm leaf beetles and slim-flux.



2. **Hackberry** (*Celtis occidentalis*) is a native tree found throughout Nebraska having a medium to long life span. The leaves are elm shaped and the grayish brown bark has a warty appearance. Once established, a moderate rate of growth and tolerance to adverse weather can be expected.



3. **Honeylocust** (*Gleditsia triacanthos*) is native to eastern Nebraska but its adaptability and drought resistance makes it ideal for planting throughout Nebraska. This medium lived, relatively fast growing tree lends itself well to windbreak plantings. Its fine-textured foliage gives partial shade and turns a golden yellow in the fall. The mimosa webworm and other insects present minor problems.



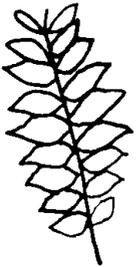
4. **Eastern Cottonwood** (*Populus deltoides*) is the Nebraska state tree. Cottonwood is usually found along rivers, around lakes and on sub-irrigated land. Its fast growth provides protection and lumber in a short time. Today cottonwood provides most of the lumber processed in Nebraska. Trees can become infested by leaf beetles, twig borers, and stem canker.



5. **Northern Red Oak** (*Quercus rubra*) is a medium size tree native to eastern Nebraska. Red oak has a medium growth rate and oval shaped crown with bronze-red autumn color. Oak wilt, a vascular disease, is a potentially serious problem. It is not recommended for planting in the western half or extremely northern part of the state due to moisture and soil limitations.



6. **Silver Maple** (*Acer saccharinum*) is a fast growing medium lived tree native to eastern Nebraska. The species is ideal for wet bottomland sites and can easily recover from extended periods of flooding. It has good performance on uplands, but it does not tolerate alkaline soil conditions. The wood is brittle and will break in wind, snow, or ice storms. Possible problems are multiple main stems, cottony scale insects, green striped maple worms, and maple bladder gall mites.



7. **Black Walnut** (*Juglans nigra*) is native to Nebraska's eastern fertile bottomlands. It is highly prized for its rich chocolate brown wood and nut meats. Walnut has a medium growth rate and long life span. Straight, limb-free trees are very valuable in the timber industry. It requires a deep silty-loam soil having good internal drainage. Tent caterpillars and Webworms can give the tree an unsightly appearance, but seldom do any permanent damage.



8. **Green Ash** (*Fraxinus pennsylvanica*) is commonly found throughout the state with its favorite habitat in moist bottomlands. Green ash has been used as a windbreak tree throughout Nebraska because of its adaptability to soil and moisture conditions. This medium size tree has beautiful yellow foliage in the fall. Possible problems may be caused by ash borers, oyster shell scale, ash rust, leaf scorch and stem canker.

9. **Eastern Red Cedar** (*Juniperus virginiana*) is highly adapted and has the highest survival of conifer planted in Nebraska. Its deep taproot and small leaf surface make it very resistant to drought. Foliage turns a russet color in winter. Two foliage diseases, *Cercospora* and *Phomopsis*, can kill the tree if not controlled. *Cercospora* blight is common and widespread. *Phomopsis* blight is less common and considered of minor importance. Spider mites occasionally cause damage and young trees may require protection.

10. **Rocky Mountain Juniper** (*Juniperus scopulorum*) Rocky mountain juniper is very similar in appearance to eastern red cedar, but is slower growing. It is drought resistant, prefers slightly alkaline soils, and retains a bluish-green color throughout winter. It is subject to the same insect and disease problems as eastern red cedar, but *Phomopsis* blight is very serious in eastern Nebraska so it is not recommended for planting in the eastern 1/3 of the state.

11. **Ponderosa Pine** (*Pinus ponderosa*) the most widely distributed tree in North America, occurs in areas having limited summer rainfall. It can withstand prolonged drought, and is the best pine to use on severe sites. Pine tip moths are often serious pests and can kill or deform trees if not controlled. Two foliage diseases, *Diplodia* tip blight and *Dothistroma* needle blight, can severely damage the tree if not controlled.

12. **Austrian Pine** (*Pinus nigra*) Austrian pine closely resembles ponderosa, but needles are generally stiffer and buds are silver colored in winter and early spring. Originally introduced from Europe as an ornamental it has considerable value as a Christmas tree. It is subject to the same insect and disease problems as ponderosa pine, but is more susceptible to *Diplodia* tip blight and less susceptible to pine tip moths.

13. **Scotch Pine** (*Pinus sylvestris*) a native of Europe, is widely planted as a Christmas tree. Older trees have orange colored bark in the crown. This species is not as drought resistant as ponderosa or Austrian pine. Two foliage diseases, *Diplodia* tip blight and brown spot, can severely damage the tree if not controlled. It is also subject to pine tip moth injury.

14. **Colorado Blue Spruce** (*Picea pungens*) has characteristics desired for a good wind-break tree, but is slow growing. It is wind firm and has a blue to green color. It is subject to damage or death when high or low temperature extremes are combined with strong wind. Spider mites, pine needle scale, and spruce needle miner are insect problems.

## Nebraska Vegetative Zones

The amount of annual precipitation has a direct effect on a tree's rate of growth, life span, and space requirements. For each tree species find your correct zone and read across Table 1. Note delineation of vegetative zones on the Nebraska map.

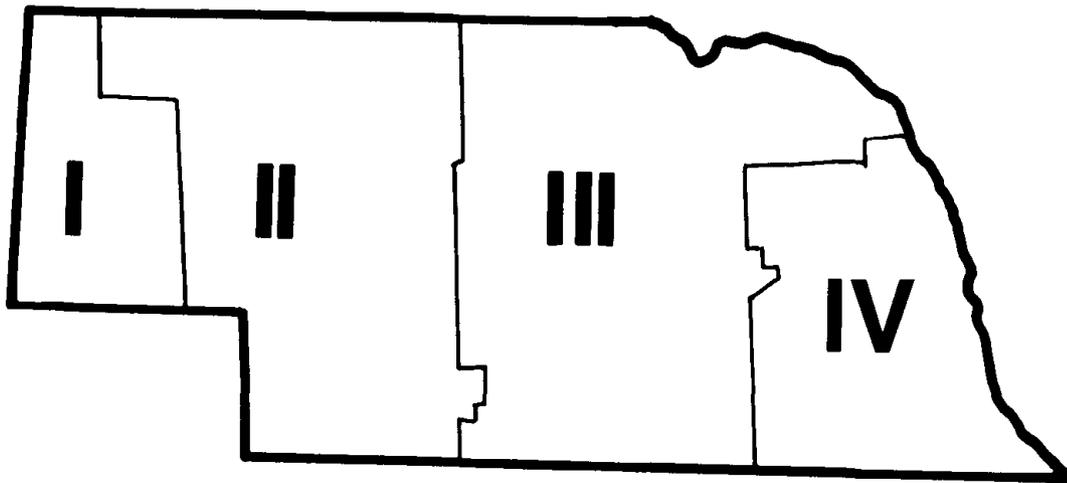


Figure 1. Vegative Zones

## Deciduous Trees

Name	Approximate Zone	Life Span (Yrs)
Siberian Elm	IV	---
	III	30
	II	30
	I	25
Hackberry	IV	80
	III	80
	II	60
	I	60
Honeylocust	IV	60
	III	60
	II	60
	I	40
Cottonwood	IV	100
	III	100
	II	80
	I	80
Red Oak	IV	150
	III	150
	II	---
	I	---
Silver Maple	IV	80
	III	60
	II	60
	I	---
Black Walnut	IV	100
	III	80
	II	80
	I	---
Green Ash	IV	80
	III	80
	II	60
	I	60

Key: --- -- Not recommended in this zone

## Conifer Trees

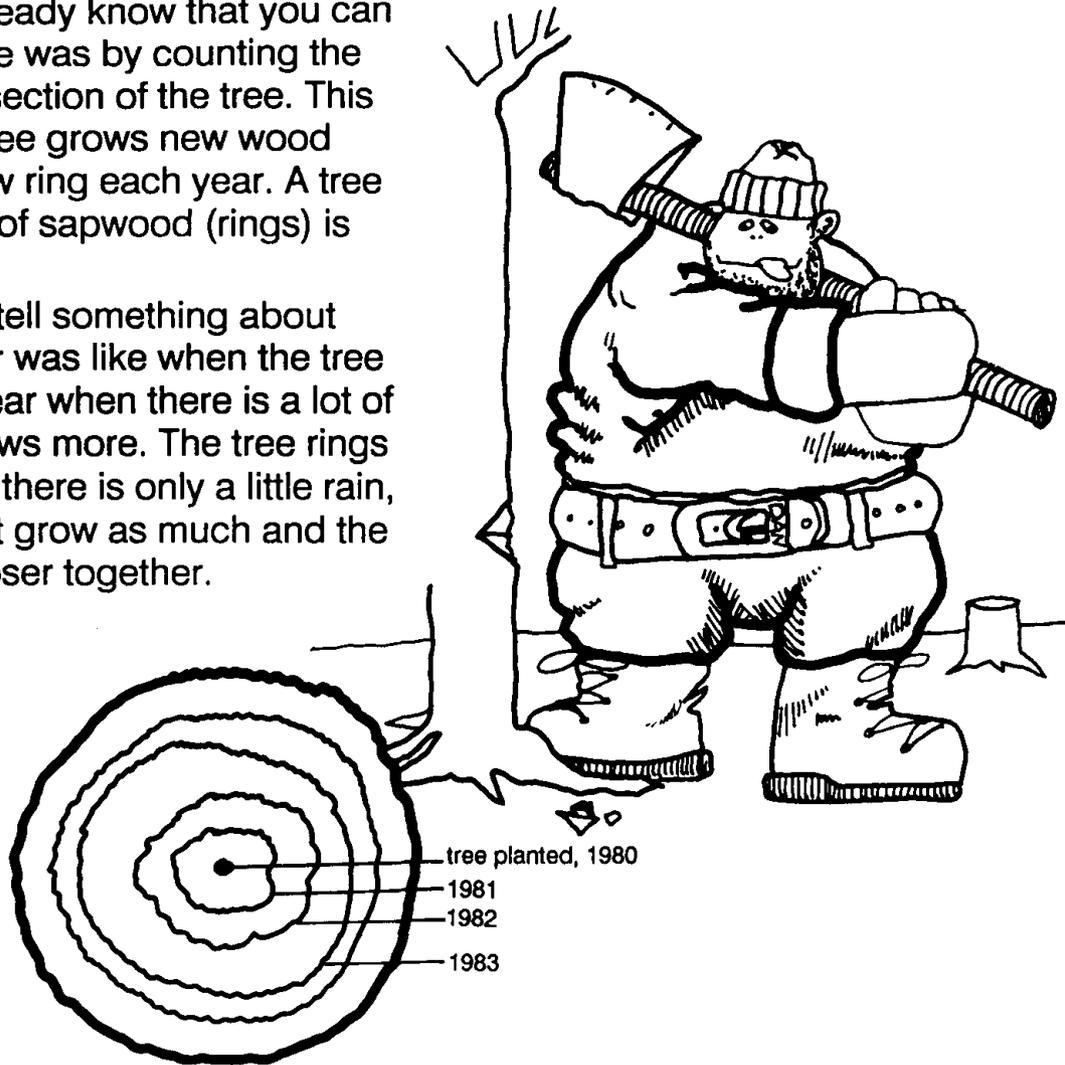
Name	Zone	Approximate Life Span (Yrs)
Eastern Red Cedar	IV	100
	III	100
	II	100
	I	80
Rocky Mountain Juniper	IV	---
	III	---
	II	100
	I	100
Ponderosa Pine	IV	200
	III	200
	II	150
	I	150
Austrian Pine	IV	100
	III	100
	II	80
	I	80
Scotch Pine	IV	80
	III	70
	II	60
	I	60
Colorado Blue Spruce	IV	120
	III	80
	II	60
	I	50

Key: --- - Not recommended in this zone

## Tree Rings

Tree rings can tell us many things. You probably already know that you can tell how old a tree was by counting the rings in a cross section of the tree. This is because the tree grows new wood and makes a new ring each year. A tree with nine circles of sapwood (rings) is nine years old.

You can also tell something about what the weather was like when the tree was alive. In a year when there is a lot of rain, the tree grows more. The tree rings are wider. When there is only a little rain, the tree does not grow as much and the tree rings are closer together.



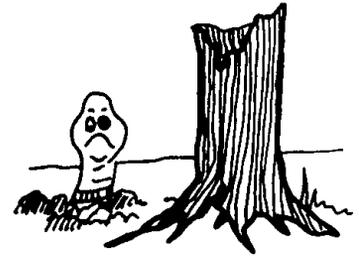
**Directions:** Use the cross section above to answer the questions.

1. During what year was this tree cut down? \_\_\_\_\_
2. How old was the tree when it was cut? \_\_\_\_\_
3. Between what years was there a lot of rain? \_\_\_\_\_ and \_\_\_\_\_
4. Between what years was there just a little rain? \_\_\_\_\_ and \_\_\_\_\_

Some giant sequoias have more than 3,500 rings. Were these trees living before America was discovered? \_\_\_\_\_

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Activity 25  
Tree Conservation  
We Must Protect Our Trees



**Subject Area:** Language Arts, Art

- Objectives:**
1. The students will understand more about the need to protect trees.
  2. The students will find the correct homonyms in a story.
  3. The students will complete sentences with the correct synonym.
  4. The students will discover some ways to prevent forest fires.
  5. The students will design a billboard.

**Suggested Grade Level:** 3-4

- Materials:**
1. Worksheets 1-3
  2. Poster paper

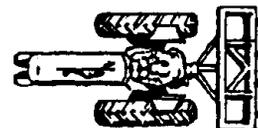
- Procedure:**
1. Ask students how can we take care of our forests? (To prevent forest fires put out all campfires and never throw out lit matches, cigarettes or cigars. To prevent soil erosion on hills keep enough trees growing so the roots will help hold down the soil and provide homes for animals and insects.)
  2. Have them complete the attached Worksheets 1-3. Correct - discuss together.
  3. Have students design a billboard promoting ways to protect our forests. Use the ideas from discussion and the worksheets.

**Additional Activity:**

1. Worksheet 4

**Adapted From:**

1. Conservation for Children



**Directions:** Correct the story by drawing a circle around the right homonym.

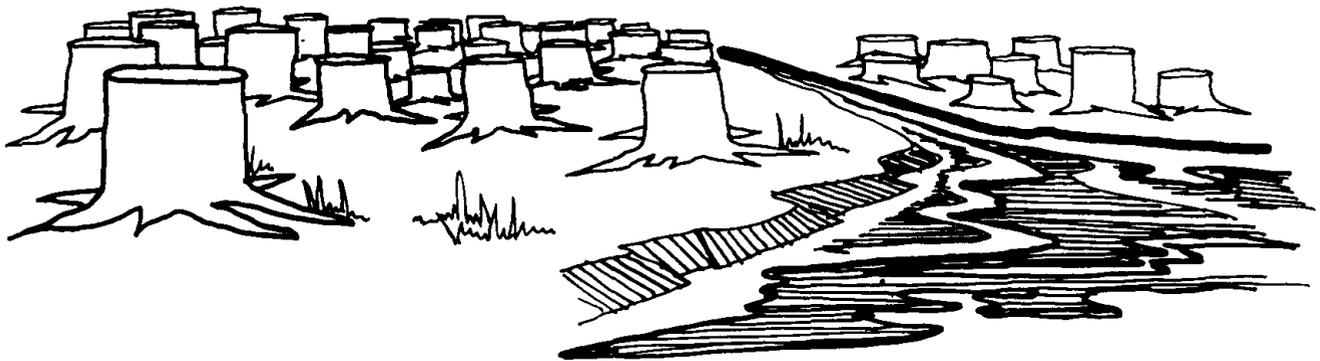
## Our Forest

When the first settlers came to America, forests covered ( too, two ) thirds of the land. The settlers cut down the trees to make room for ( their, they're ) farms. They used the ( would, wood ) to build houses and to burn for fuel.

Soon loggers and farmers were cutting down ( hole, whole ) forests. They often "clear cut" areas of land. This means they used big machines to knock down all the trees. When they were ( threw, through ), the land was ( bare, bear ).

( Some, Sum ) people said, "We ( no, know ) there will always be more trees. " But, they where wrong. Other people began to worry about ( our, hour ) forests. They ( new, knew ) that clear cutting of forests could cause floods and destroy the homes of animals. They helped to get laws passed to protect our forests.

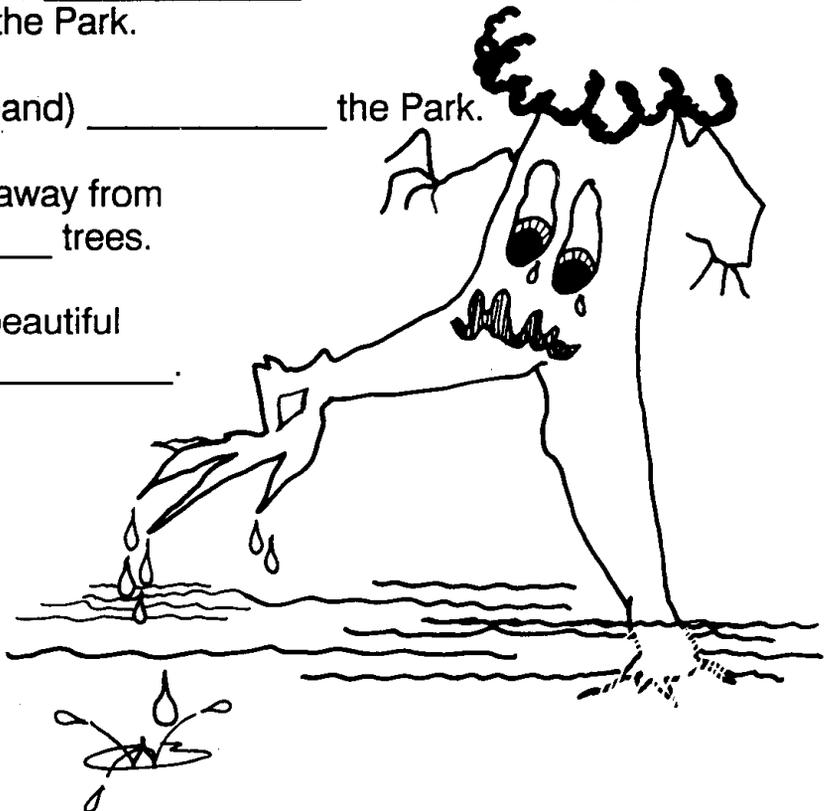
Conserving a forest does ( knot, not ) mean leaving the trees alone, for the forest is a living, renewable resource. It means protecting the forest and using it wisely.



**Directions:** Synonyms are words that have the same, or almost the same, meaning. Use the words below to complete the sentences. Choose the word that has almost the same meaning as the word in the parentheses ( ).

enlarge      damage      endangered      protected  
 overflow      distress      stripping      soil

1. The trees in Redwood National Park were in (trouble) \_\_\_\_\_.
2. Lumber companies were (clearcutting) \_\_\_\_\_ trees from the lands next to the park.
3. When it rained, (dirt) \_\_\_\_\_ ran off the treeless land and into the Park.
4. The rainwater caused Redwood Creek to (run over) \_\_\_\_\_ its banks.
5. The flood water began to (hurt) \_\_\_\_\_ the roots of the biggest and oldest redwood trees in the Park.
6. Then Congress voted to (expand) \_\_\_\_\_ the Park.
7. This kept the loggers farther away from the (threatened) \_\_\_\_\_ trees.
8. Hopefully, this will keep the beautiful old redwood trees (safe) \_\_\_\_\_.



### Forest Fires

Fire can destroy large parts of our environment. Some forest fires are caused by nature, but most are caused by people. A forest fire kills animals and plants. When there is a forest fire, even the animals that can run away lose their homes and the places where they get their food.

**Directions:** Read the newspaper stories. Draw a line under the sentence that tells how the fire started. Write **people** or **nature** on the spaces to show who caused the fire.



#### Fire Burns 500 Acres

Forest rangers believe that the fire was started by a campfire that was left burning. Five hundred acres were destroyed by the fire.

---

#### Fire in National Forest

Lightning struck a large tree in the Green Pines forest. The tree burst into flames. The fire was first seen by Rangers in the lookout station on White Mountain.

---

#### Forest Fire Under Control

The fire in Smokey Mountain Park has been put out. Firemen think it was caused by a burning cigarette thrown from a car.

---

#### Rangers Put Out Fire

A broken glass bottle and the heat of the sun started the fire in Blue Ridge Park. The fire was quickly put out by the fast action of the Park ranger.

---

Forest Rangers do many things to help the 'balance of nature'.

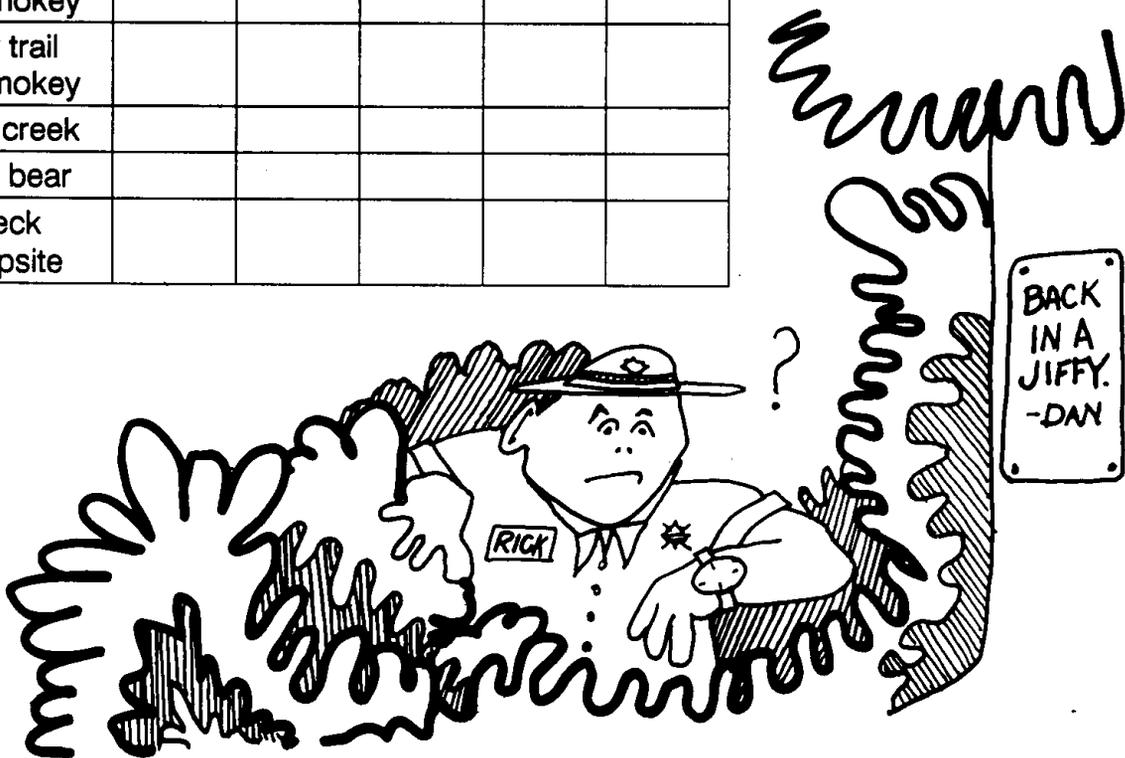
Ranger Dan has five things planned to do today. He is going to stock the creek with baby trout, move a troublesome bear to a new place, and check the campsite for litter that could be harmful to animals. He is also going to clear the hikers' trail on Mt. Smokey and plant some new pine tree seedlings there.

His partner, Ranger Rick, wants to find him but doesn't know at what time he will be there. Help Rick figure out when Ranger Dan will be at each place. Rick has the following information.

1. Ranger Dan will not go to Mt. Smokey before 3:00 p.m.
2. Ranger Dan won't stock the creek or move the bear after 1:00 p.m.
3. Ranger Dan will only clear the trail or stock the creek on the hour.

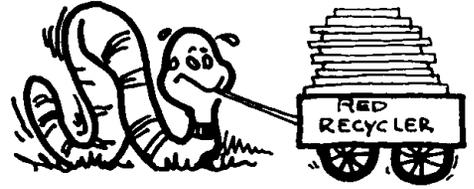
**Directions:** Write 'no' or 'yes' in every box where you know the answer. Once you have a 'yes', all the other boxes in that row or column must be a 'no'. Remember that Ranger Dan will only be at each place once.

	10:00 a.m.	11:30 a.m.	1:30 p.m.	5:00 p.m.	9:30 p.m.
Plant trees on Mt. Smokey					
Clear trail Mt. Smokey					
Stock creek					
Move bear					
Check Campsite					



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Activity 26  
Tree Conservation  
Recycle and Save a tree



**Subject Area:** Science, Math, Handwriting

- Objectives:**
1. The students will realize the importance of recycling paper by observing how much paper is thrown away.
  2. The students will practice handwriting by writing letters about recycling.

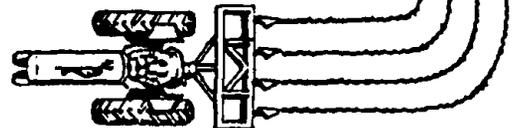
**Suggested  
Grade Level:** 3-4

**Background:** You use paper products and save them for recycling. The paper is collected and stored. Then it is delivered to a paper mill where it is prepared for de-inking. In de-inking paddles beat the paper to pulp and remove old ink, glue and staples. A screen shakes the pulp into a flat wet mass which is moved to heated drying rollers which squeeze water out of the pulp and dry it into new paper and cardboard. The new paper and cardboard is then delivered to printers and box makers who use it to make new products.



- Materials:**
1. Worksheets 1 and 2
  2. Writing paper (Worksheet 3)
  3. Awards (Activity Sheet 1)
  4. "Pounds of Paper" Chart (Worksheet 4)
  5. Trash basket in your room (semi-full of trash)
  6. Paper bags for trash collection
  7. Scale
  8. Heavy paper
  9. Paste

- Procedure:**
1. Empty the trash basket in the room. What is in it? Can you sort the trash? Are there any papers in it that could be used again? What is paper made from? Why are trees important other than for paper? Why is it important to conserve paper? What does conserve mean? How can we conserve paper here at school or home? What happens to the trash after it leaves here? How can we find out? Does it cost money to have the trash disposed of? Who do you think pays for all this? Why does it cost money? Do not expect answers from all the children. Just ask so they will start wondering. Pick out several items.



2. Visit the school cafeteria. Look into the trash for paper products. What kind of things do you see? Pick out several sample items.
3. Walk around the school yard or the block. Pick up sample items of paper products.
4. Return to the classroom, paste and label these paper items on heavy paper to show what paper products were found and could have been recycled instead of thrown out. This might have helped to save a tree.
5. Have students complete the attached Worksheets 1 and 2.
6. Have a newspaper recycling contest. Have it with another class, with your grade level, or with the whole school! See who can bring in the most paper by a certain date.
  - a. Explain to students that they need to save old newspapers and bring them to school. They will be taken to be recycled when the time limit is up.
  - b. Have students copy the letter below, on Worksheet 3. This needs to be in their best handwriting. Then have them take it home to share.

\*\*\*\*\*

\_\_\_\_\_, 19\_\_\_\_

Dear \_\_\_\_\_,

In school we have been learning how to conserve trees. We are going to collect as many old newspapers as we can to have them to recycled. We want to recycle newspaper because paper is made from trees. Used paper can be chopped up and remade into new paper instead of cutting down more trees.

You can help save the trees too! All you have to do is help me collect old newspaper. I can start taking papers to school tomorrow

\_\_\_\_\_, 19\_\_\_\_.

Your Tree Lover,

\_\_\_\_\_

\*\*\*\*\*

7. Put up and explain the "Pounds of Paper" Chart, Worksheet 4.
  - a. Every time a student brings in newspapers he/she should receive a Congratulations award, Activity Sheet 1, with their name on it. Set a time aside each day when you collect the papers and record information on the chart.
  - b. Take the papers to recycling, if money is given use it for the classroom. Maybe to purchase a ream of recycled writing paper.
  - c. Have students make a Congratulations award for their parents.
  - d. At the end of the project have students copy this letter to take home on Worksheet 3.

\*\*\*\*\*

Dear Tree Lover,

Thank you for helping us to save a tree! We collected a grand total of \_\_\_\_\_ pounds of newspaper. On \_\_\_\_\_, 19\_\_\_\_ we collected the most of any day, \_\_\_\_\_ people brought in a total of \_\_\_\_\_ pounds of paper.

Your Official Tree Lover,

\_\_\_\_\_

\*\*\*\*\*

**Additional  
Activities:**

1. Worksheets 5 - 16
2. Watch a film or filmstrip on paper recycling.

**Adapted  
From:**

1. Nebraska's Guide to Environmental Resources
2. Conservation for Children
3. Ecology and Energy Action Pack  
McDonald's Corporation



**CONGRATULATIONS**

\_\_\_\_\_  
You just saved a tree!  
\_\_\_\_\_



**CONGRATULATIONS**

\_\_\_\_\_  
You just saved a tree!  
\_\_\_\_\_



**CONGRATULATIONS**

\_\_\_\_\_  
You just saved a tree!  
\_\_\_\_\_

Name \_\_\_\_\_





Wood pulp is the main material used to make paper. If used paper is chopped up and remade into new paper, fewer trees will have to be cut. This is called recycling paper. Recycling is a great help in saving our forests. By saving your newspapers and bringing them to be recycled, you will help save our trees.

**Directions:** Fill in the blank spaces with the correct words.

1. Recycling paper saves \_\_\_\_\_.
2. A large group of trees is called a \_\_\_\_\_.
3. When paper is chopped up to make paper, it is called \_\_\_\_\_.
4. Using old paper to make new paper is called \_\_\_\_\_.
5. You can save trees by recycling \_\_\_\_\_.

paper      pulp      forest      trees      recycling

# How Paper is Recycled

Cut out the puzzle pieces on this page.  
Then assemble them in their proper order.

**C**  
In de-inking, paddles beat the paper to remove pulp and old ink, glue and staples.

**L**  
A screen shakes the pulp into a flat wet mass which is moved to ...

**A**  
... where it is prepared for de-inking.

**R**  
You use paper products and save them for recycling.

**N**  
The new paper and cardboard is then delivered to printers and box makers ...

**E**  
The paper is collected and sorted.

**G**  
... who use it to make new products.

**I**  
... heated drying rollers which squeeze water out of the pulp and dry it into new paper and cardboard.

**C**  
Then it is delivered to a paper mill ...





**Directions:** Read the sentences. Circle the correct word.

1. You have ( heard, hear ) that paper comes from trees.
2. Did you know that paper can be ( make, made ) from old used paper.
3. It is ( called, calling ) recycling paper.
4. Cardboard ( come, comes ) from old paper with the ink left in.
5. Paper companies are ( cut, cutting ) down more and more trees to make paper.
6. New trees are not ( growing, growed ) fast enough to replace trees that are cut.
7. Some companies are ( chop, chopping ) down trees in our national forests.
8. If we recycle our paper, we can help to ( save, saves ) some of our trees.
9. You can collect old newspapers and ( take, took ) them to a recycling center.
10. You can ( recycling, recycle ) paper at home and at school.
11. ( Use, Used ) the back of old paper for scratch paper.
12. Can you ( thinks, think ) of other ways to recycle paper?

Name \_\_\_\_\_ 

Fill in the missing numbers on the calendar.

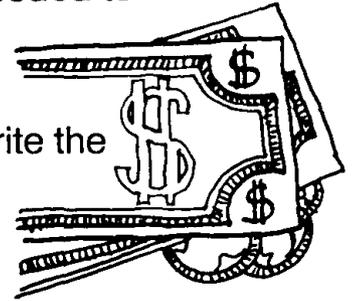
**July**

Sun.	Mon.	Tue.	Wed.	Thu.	Fri.	Sat.
		1	2		4	5
6		8		10	11	
13			16	17		19
	21	22				26
	28	29	30	31		

Use the calendar to answer the questions.

1. Andrew is going to start collecting newspapers on July 2nd. What day of the week is that? \_\_\_\_\_
2. By the first Sunday in July he has collected 30 pounds. What date is that? \_\_\_\_\_
3. He must have all his papers collected on the last day of the fourth week. What day is that? \_\_\_\_\_
4. He has to take his papers to the recycling center on July 28th. This day is called \_\_\_\_\_.
5. The last day of the month is \_\_\_\_\_, \_\_\_\_\_.  
This is when the recycling center takes all the papers to the paper company.

Recycling is one way people are helping the "balance of nature." By recycling materials, we save many of the natural resources needed to make the things we use and can make money too.



**Directions:** Read how much money each person made. Write the amounts in standard notation.

1. Joan collected newspapers for recycling. She sold them to a paper pulp company for two dollars, one quarter and four pennies.

\_\_\_\_\_

2. Jack and Bob cashed in their aluminum cans. They made three dollars, four dimes and one nickle.

\_\_\_\_\_

3. Sally returned her deposit bottles to the store. She got one dollar, two quarters, one dime and one nickle.

\_\_\_\_\_

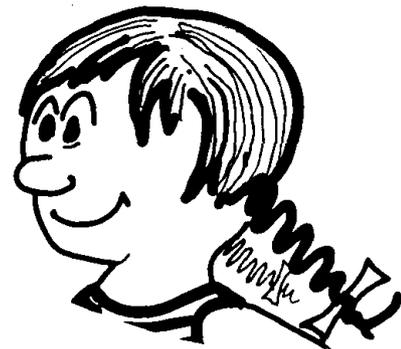
4. Rex saved cardboard which he sold to a scrap dealer. He made three dollars, two dimes and four pennies.

\_\_\_\_\_

5. The Boy Scout troop saved magazines for a whole year. When they sold them, they made thirty two dollars, one quarter, one dime and two pennies.

\_\_\_\_\_

6. Jennifer saved magazines. The scrap dealers do not want them because much of the paper is coated with plastics and cannot be easily recycled. Jennifer gave them to the hospital instead. She didn't make any money, but she did make lots of friends.



## Recycling Newspapers

Old newspapers can be recycled. that means they can be used again instead of being thrown away or burned. You should save your old newspapers and take them to a paper mill. Paper mills will pay you money for bringing in old newspapers.

The paper mills have their own ways of making the old newspapers into new paper. They soak the newspapers with water and beat the pulp with paddles. Then the wet pulp is put through heated drying rollers. These rollers squeeze the water out of the pulp and dry it into new paper and cardboard.

When we use paper which has been recycled, we are saving trees. It takes about seventeen trees to make one ton (2,000 pounds) of paper.



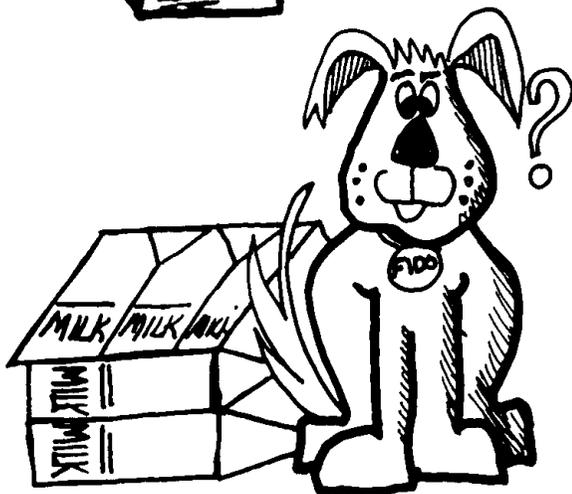
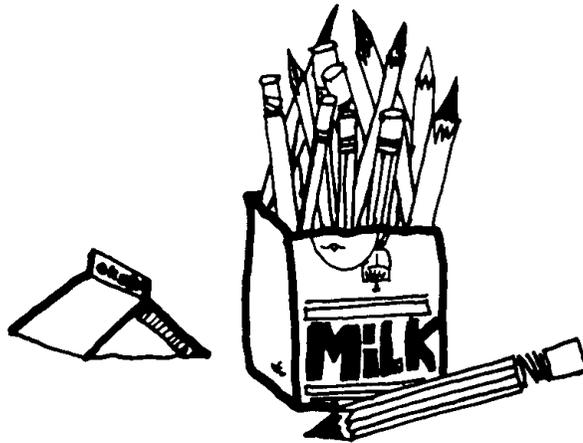
### Directions: Answer the questions

1. What can you do with old newspapers besides throwing them away, making paper hats, or burning them?  
\_\_\_\_\_
2. What does recycle mean?  
\_\_\_\_\_
3. When the paper mills make paper from trees, they use wood chips from trees and cook them with water to make pulp. To make recycled paper, what do the paper mills mix with water to get pulp?  
\_\_\_\_\_
4. How many trees does it take to make one ton of paper?  
\_\_\_\_\_
5. What do you think is one of the most important reasons for recycling newspaper?  
\_\_\_\_\_

Recycling helps save our natural resources. It is a way of using things and materials over again. When we recycle things, we don't need to use more of our natural resources.

Carole is drinking milk for lunch. The milk comes in a carton that is made from paper which comes from wood. She wants to recycle the milk carton.

**Directions:** Color the pictures that show ways Carole could recycle the milk carton.

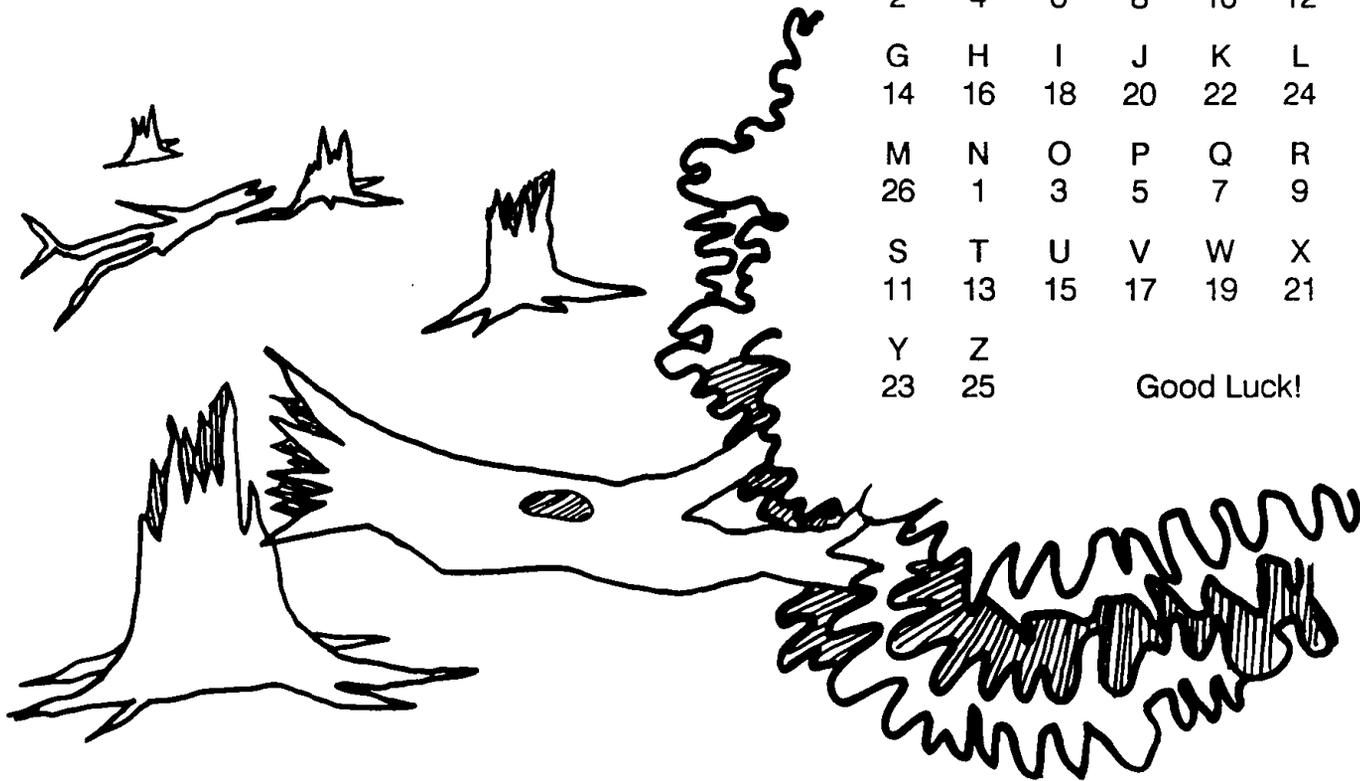


Name \_\_\_\_\_ 

**Directions:** Use this code to read the message.

A	B	C	D	E	F
2	4	6	8	10	12
G	H	I	J	K	L
14	16	18	20	22	24
M	N	O	P	Q	R
26	1	3	5	7	9
S	T	U	V	W	X
11	13	15	17	19	21
Y	Z				
23	25				

Good Luck!



5 2 5 10 9      18 11      26 2 8 10      12 9 3 26

13 9 10 10 11      18 11      11 3 26 10 13 16 18 1 14      19 10

2 24 24      22 1 3 19      11 3      18 12      19 10      19 2 11 13 10

3 15 9      5 2 5 10 9      26 3 9 10      13 9 10 10 11

19 18 24 24      16 2 17 10      13 3      14 3      !

**Directions:** Read the problems. Write the numerals on the blank spaces.

1. Carole and Judy are saving cans for recycling. They each have eight cans so far. How many cans do they have together?

$$\underline{\quad\quad} \times \underline{\quad\quad} = \underline{\quad\quad} \text{ cans}$$

2. Tom, Dick and Harry are saving cans too. They have each saved nine cans. How many cans do they have all together?

$$\underline{\quad\quad} \times \underline{\quad\quad} = \underline{\quad\quad} \text{ cans}$$

3. Six girls in the third grade each saved seven stacks of newspapers. How many stacks of newspapers do they have in all?

$$\underline{\quad\quad} \times \underline{\quad\quad} = \underline{\quad\quad} \text{ stacks of newspapers}$$

4. Bob and Betty saved four boxes of glass bottles. Each box had eight bottles in it. How many bottles did they have all together?

$$\underline{\quad\quad} \times \underline{\quad\quad} = \underline{\quad\quad} \text{ bottles}$$

5. Jim and Mary were saving bottles too. They had five boxes of bottles. Each of their boxes had seven bottles in it. How many bottles did Jim and Mary have?

$$\underline{\quad\quad} \times \underline{\quad\quad} = \underline{\quad\quad} \text{ bottles}$$

6. If Bob and Betty put their bottles together with Mary and Jim's, how many will they have in all?

$$\underline{\quad\quad} + \underline{\quad\quad} = \underline{\quad\quad} \text{ bottles}$$



**Directions:** Draw one line under the complete subject. Draw two lines under the complete predicate.

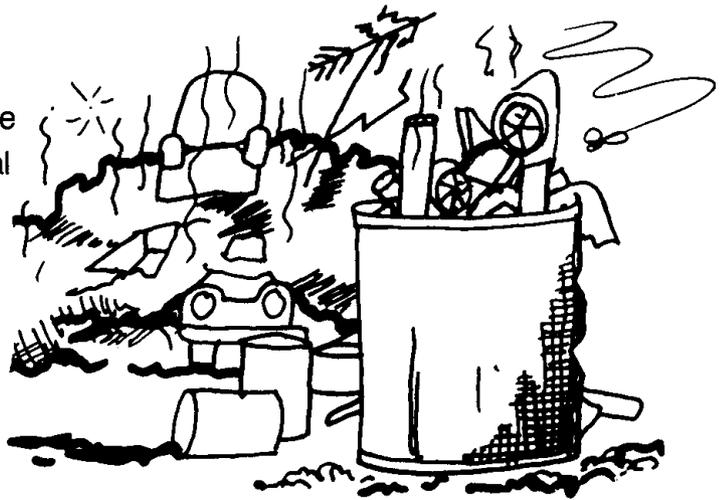


1. Recycling is important.
2. Our natural resources will last longer.
3. We won't have as much trash.
4. Many materials can be recycled.
5. Glass, tin, aluminum and paper can be used to make new things.
6. All of us can save newspapers for recycling.
7. Some paper companies will buy old newspapers.
8. People can save energy and money too.

**Directions:** Read the story then answer the question below.

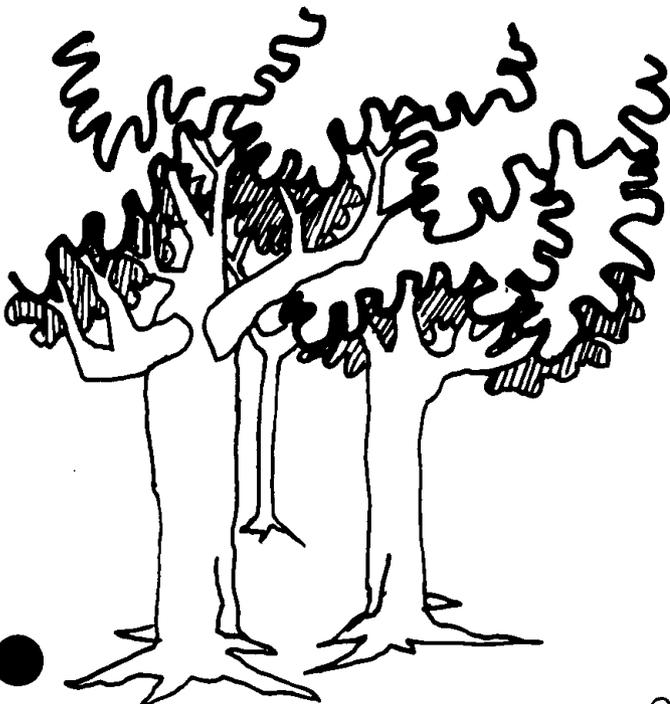
**Recycling**

Recycling means the reuse of materials that we have thrown away after using them in their original form. We can recycle glass, aluminum, tin, paper and many other materials. Recycling can mean shredding old cans and cars and melting the pieces to make new metal for new cans and new cars. It can also mean crushing bottles into tiny glass bits and melting these bits to make new glass. Lots of materials can be recycled.



There are two main reasons for recycling materials. First, America is running out of raw materials to make new products. By using the same materials over and over again, we can help save our natural resources.

The second reason why we should recycle materials is to get rid of our growing piles of trash. When we throw used bottles and cans away, they become trash. Since there are more people in America today, there is also lots more trash. Getting rid of all the trash is one of our biggest problems. By recycling we reuse our trash instead of having to get rid of it. This solves part of our problem of what to do with the trash.



**Why is it important to recycle materials?**

- 1. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
- 2. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

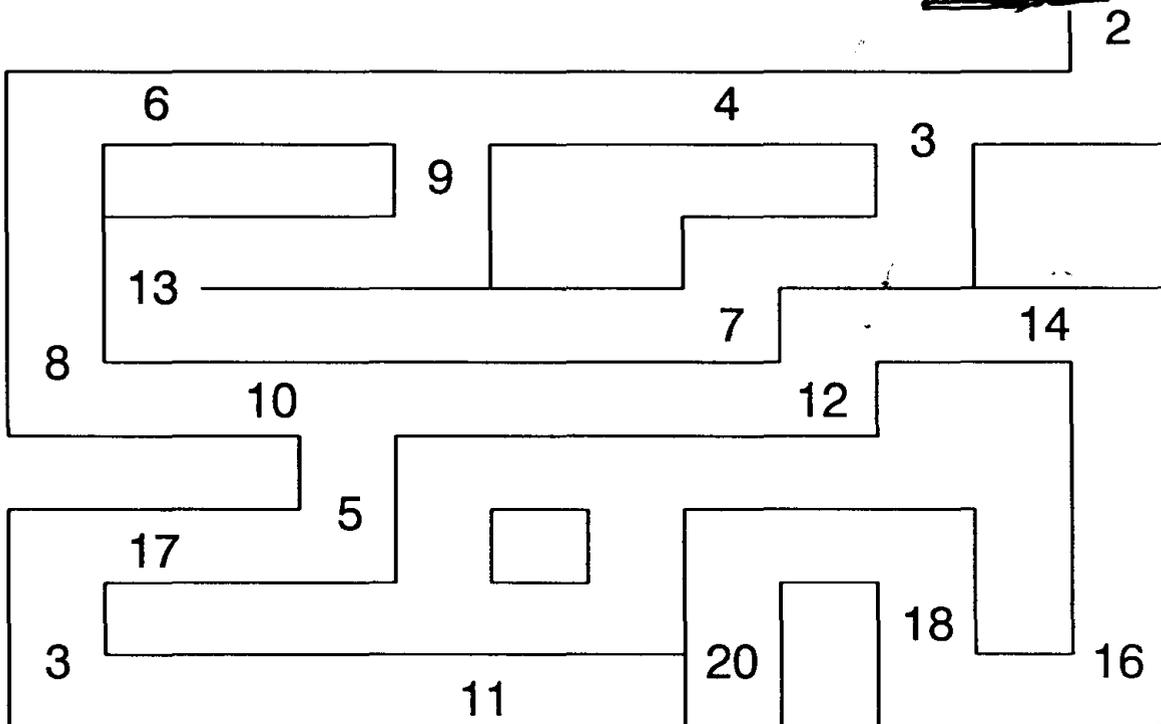
Name \_\_\_\_\_



Joe and Betty are helping to save our natural resources. They are taking used cans, paper and glass to the recycling center.



**Directions:** Help them find their way. Follow the path with the **even** numbers.

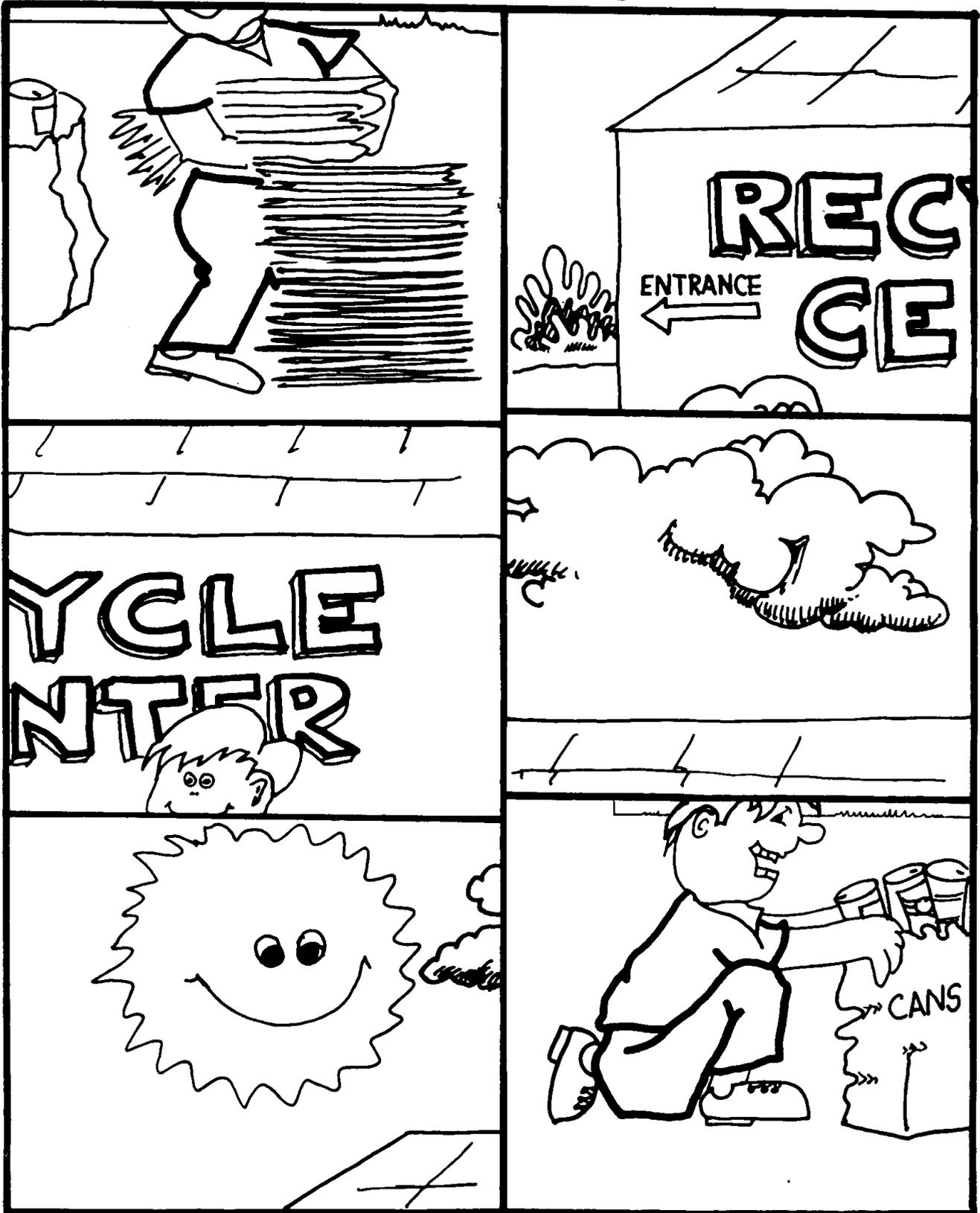




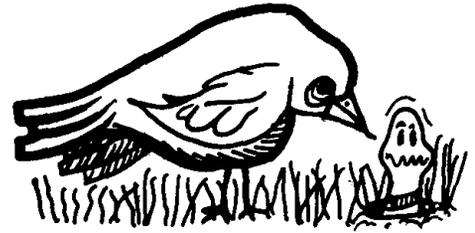


Here is one way to save our natural resources.

**Directions:** Cut out the pieces. Put the puzzle together.



Activity 27  
Wildlife Conservation  
The Food Chain



**Subject Area:** Science

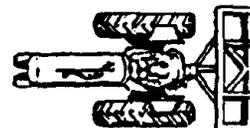
- Objectives:**
1. The students will realize the food chain is interdependent at all levels and is based on food production by plants.
  2. The students will realize how man can harm and help the food chain.

**Suggested  
Grade Level:** 3-4

**Background:** Food chains are complex in any animal community. Several food chains make food "webs" and are interconnected in many different ways. You can probably recall many different food webs from your own experience. Grasshoppers feed on grass; birds and frogs eat the grasshoppers; snakes eat birds, frogs and mice; hawks and owls will eat other birds as well as snakes, frogs, and mice; when the hawk or owl dies its body is fed upon and decomposed by worms, fungi and bacteria; worms, in turn, are eaten by birds nutrients returned to the soil in the decay process are used in plant growth, and so it goes. If you were to try and connect green plants with a number of animals by lines representing their feeding habits, you would have a very tangled series of lines. After a little thought it will become obvious that every living thing is in deed dependent on other living things for a source of food or nutrients.

- Materials:**
1. Chalkboard
  2. Eight student jackets or old shirts they can take off/on.
  3. Construction paper or cardboard

- Procedure:**
1. Ask students the following questions, write the underlined word on the board and connect them with a line.
    - A. How many of you like ham?
    - B. From what animal do we get ham? (pigs)
    - C. What do pigs eat? (grain, other plant materials)
    - D. Where does grain come from? (plants)
    - E. Where do plants grow? (soil, ground)



This is a food chain. Here is another:



- a. What kind of wildlife food is produced by oak trees? (acorns)
- b. What large birds eat acorns? (wild turkeys)
- c. What animals may capture and eat a wild turkey? (Fox, coyote, people) Write the students' choice in the third link.

2. Tell the students they have been describing links, parts of a food chain. Define food chain.

**Food Chain** -- a series of plant and animal species in a community, each of which is related to the next as a source of food.

3. Draw a large chain with four links on the chalkboard so that there is enough space within each link to write words. Review the food chain by writing soil in the first link. (soil is the basis of life). Then write plants in the link to the right. (Plants need soil to grow.) Write pigs in the next link. (Pigs eat grains that come from plants.) Write humans in the last link. (We eat pigs for meat, pork.) Point now to soil, our waste/bodies become part of the cycle again.
4. Repeat and draw a new set of five links using this food chain. (Soil, insects, mice, snakes, eagle) When the eagle is killed or died its body will decompose back into soil and the cycle begins again.
5. This chain doesn't always work this smooth. Role play this story to explain this to students.

↓  
\*\* Select eight students and set them in a row facing the rest of the group. As they sit there, explain to them and the others that you are the owner of a small farm in (YOUR COUNTY).

Your main crop, corn, has been attacked by small insects which threaten your prospects of a good harvest. Taking the necessary steps to save your harvest, you finally buy a pesticide from the "Sure Getum" chemical company.

\* As you tell the story, give each of the eight students a jacket. The students you have selected will be the insects and the jackets will represent the chemical with which they have been sprayed. They are now dead.

\* Have four students sit down facing the dead insects. These four will be mice and each mouse will eat two insects. As they eat the insects,

they remove the jackets and put them on signifying the passage of the chemical from the insects to the mice. Each mouse is now wearing two coats, i.e., two units of spray.



- \* Select two students to sit behind the four mice. These two will be gopher snakes and each gopher snake will eat two mice. As the mice are eaten, their jackets are removed and placed upon the gopher snakes. Again, we have the passage of the chemical from one organism to another and each snake should now be wearing four jackets.
  - \* Select one student to represent an eagle. The eagle will eat the two snakes, acquiring eight jackets and will then die.
  - \* What do the eagle's eight jackets represent? How did the eagle acquire the jackets (pesticides)?
6. We need to remember that farmers need to use chemicals for their crops. If a farmer did not use a pesticide the insects would eat all of his crop. Then there would be no food for us or for the pig in the food chain we talked about earlier. Farmers conduct tests on their soil and fields to determine how much chemical his crop will need to be good and profitable. The farmer doesn't want to overuse a chemical because it can be bad for his crop as well as the wildlife. Farmers try to use enough to control insects and weeds in their fields but not too much to hurt their environment.
7. Chemicals are not the only harm to food chains. If the prey (small insects, and plants) were all gone, what would the predator (the mice) eat? They would have to find other kinds of animals/plants to eat. They might suffer from lack of food. They could move to another area but then they would be eating the food of some other mouse. If the mice didn't move on to a new area they might starve to death. If the mice starve and die what will the snakes eat? Will they die? If the snakes die of starvation what will the eagle eat?

Conservationists try to make sure that there will be enough food for wildlife and that no animal becomes too abundant for its food supply. This is part of what is called Wildlife Management.

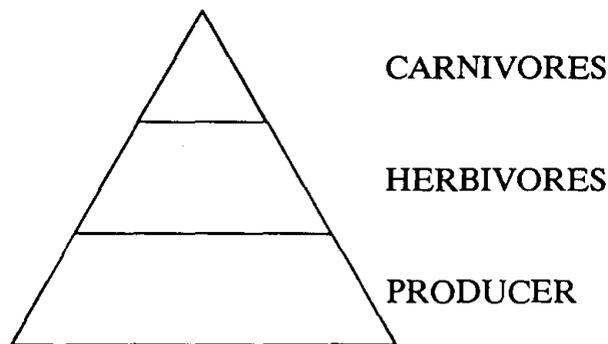
8. Have students tell how people can help wildlife. (Obey wildlife regulations which help keep the numbers of wild animals from becoming too low, take care of forests and fields which provide food and cover, protect and provide sources of water, etc.)

9. Introduce these words as they are written on the board:  
**carnivore**--something that eats meat (people, dogs, bears, eagles).

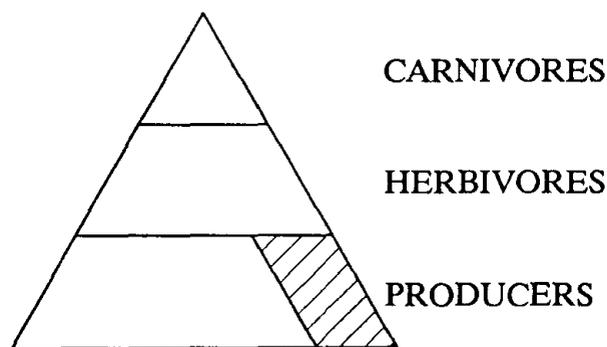
**herbivore**--a plant eater (cow, rabbit, some people, deer, squirrels, birds).

**producers**--all the plants

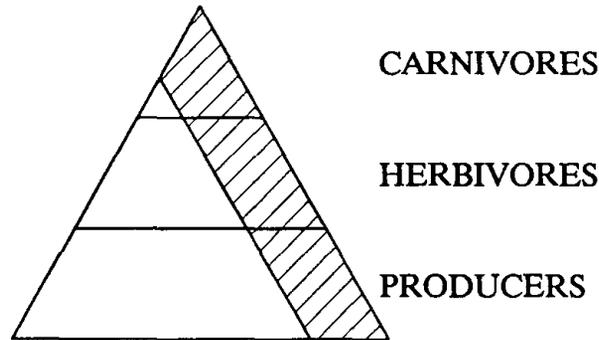
10. Have the students make a food pyramid from a piece of cardboard or construction paper. Make the pyramid about 6 inches high. Example below:



11. Now create a scenario where a portion of the plants are destroyed. (weed spray, parking lot, etc.) With a pencil and straight edge, mark out the area on your food pyramid that has been destroyed. Mark out an area parallel to the edge of the pyramid. (See example)



12. When this portion of the pyramid is destroyed it affects the rest of the food chain. Have the students extend the line parallel to the top of the pyramid. Have the students use scissors and cut off this portion of the plants, herbivores, and carnivores. (See example)



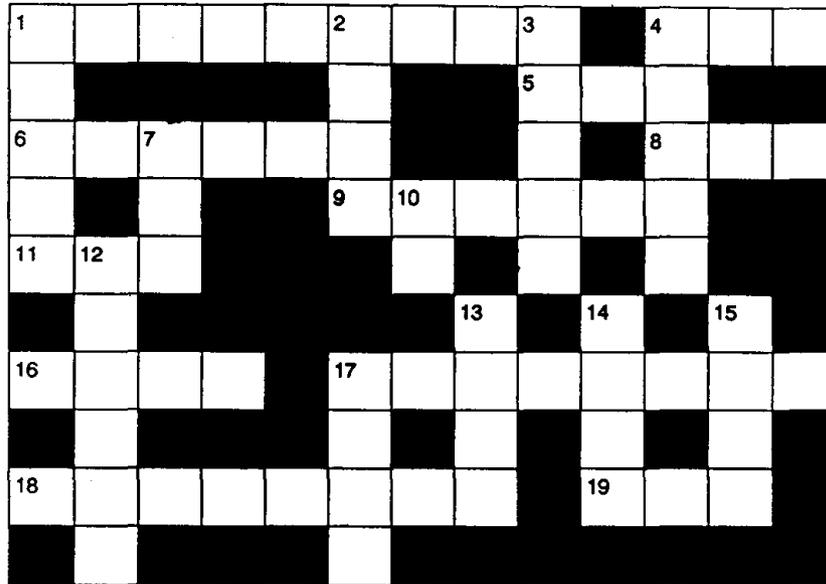
13. The area that is cut off is what is destroyed when the plants at the bottom of the pyramid are destroyed. The herbivores and carnivores can no longer live without this plant base. Discuss the food chain and food pyramid and how man upsets it. Ask the question: "What is meant by an indirect effect?" (Example - when you kill the plants the herbivores and carnivores are indirectly affected because their food supply is destroyed.)

**Additional  
Activity:**

1. Crossword Puzzle (Worksheet 1)

**Adapted  
From:**

1. The Growing Classroom
2. Soil Conservation Topics Educational Kit



Use these words:

scavenger	turtle	food	acorns	prey
eat	leaves	sad	feathers	six
cats	nest	roots	snake	up
oak	predator	sleep	bass	owl
elk	pets			

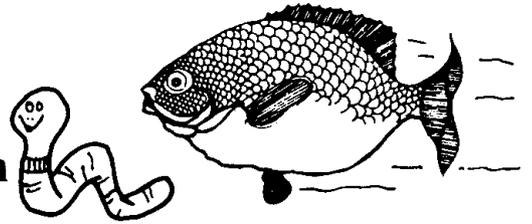
### Across

1. Animal that feeds on dead bodies of animals which they did not kill.
4. Number of legs an insect has.
5. Animal that does give a hoot.
6. Nuts produced by oak trees and eaten by deer, turkeys and squirrels.
8. What animals do with their mouths.
9. Reptile that carries its home on its back.
11. Large deer-like animal that once lived in Nebraska.
16. House pets related to mountain lions.
17. What we call an animal that captures and eats another animal.
18. Outer covering of birds.
19. What we would be if there were no animals in Nebraska.

### Down

1. Reptile without legs.
2. Birds lay eggs in this.
3. Part of tree below ground.
4. What people and some animals do at night.
7. Type of tree that produces acorns.
10. Opposite of down.
12. The green parts of a tree that make food for the tree.
13. Dogs and cats make good \_\_\_\_\_ but wild animals do not.
14. Type of fish that eat bluegills and rhymes with pass.
15. Something animals and people must have to live.
17. What we call an animal that is captured and eaten by another animal.

Activity 28  
Wildlife Conservation  
Making a Food Chain



Subject Area: Science

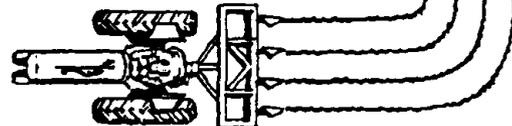
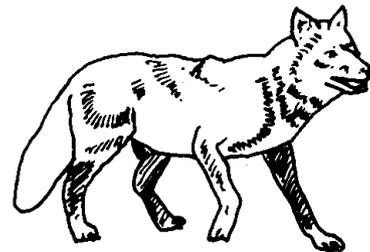
Objective: 1. The students will discover a food chain and determine answers for specified questions.

Suggested Grade Level: 3-4

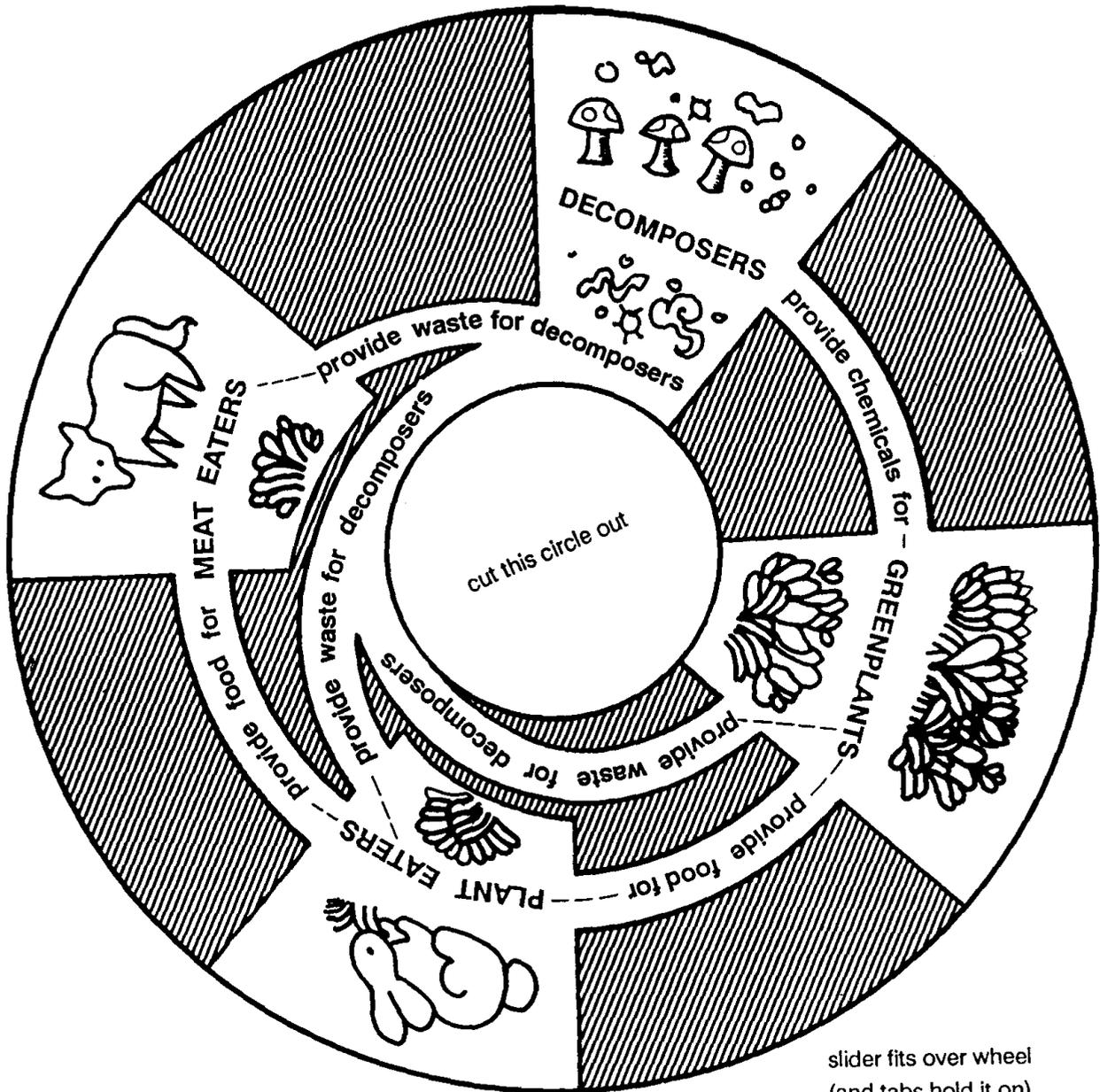
Materials: 1. Scissors  
2. Food Chain wheel  
3. Worksheets 1-3

Procedure: 1. Make a list on the chalkboard of plant eaters, meat eaters, decomposers and green plants.  
2. Cut out the wheel and slider from Worksheet 1.  
3. Use the wheel to guess the answers to the questions on Worksheet 2.  
4. Then assemble the slider as shown on the Worksheet 1 and answer the questions on Worksheet 3.

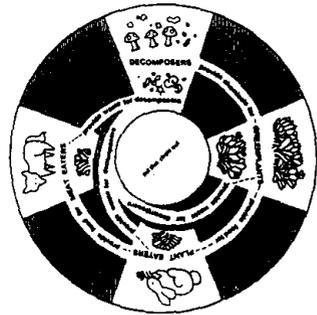
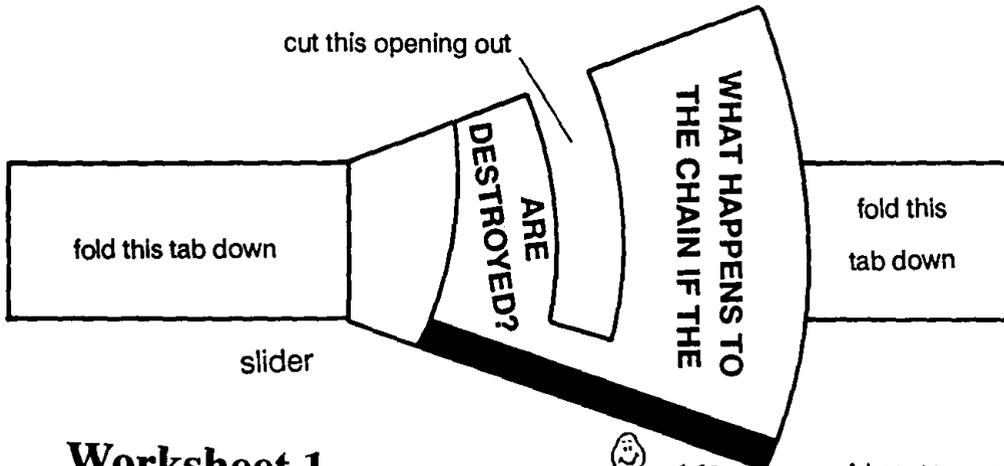
Adapted From: 1. Ecology and Energy Action Pack



# Let's look at a food chain

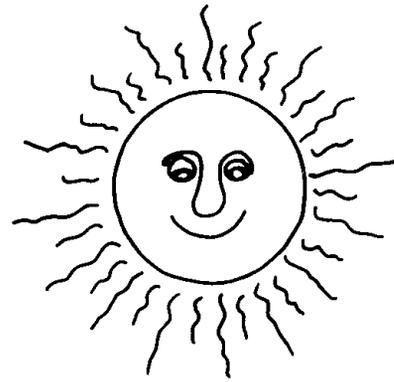


slider fits over wheel (and tabs hold it on)



# Let's Look at a Food Chain

Can you guess the answers to the following questions? Before you try, cover the answer column below with a piece of paper or fold the paper in half so you cannot see the answers. After you think about *your* answer to each question, look at the answer that is given. Use the wheel to help you think about your answers.



## Questions

1. Look at the wheel. Can you tell how plant-eaters, such as the rabbit, get their food?
2. Where do *meat-eaters*, such as the fox get their food?
3. Many animals are both meat-eaters and plant-eaters. Do you know the names of any of these animals? (This answer is not on the wheel.)
4. Find the word *decomposer* on the wheel. Can you guess the names of some decomposers?
5. What do the decomposers eat?
6. After the decomposers break down the wastes into simple chemicals what are these chemicals used for?
7. The food cycle shows how living things get their food. Can you think what else living things need besides food?

## Answers

1. This is an easy one! Plant-eaters eat green plants.
2. This is an easy one too! Meat-eaters eat other animals.
3. Some of these animals are pigs, chickens, seagulls, bears -- and *you*.
4. Some of the decomposers are certain insects, worms, molds, fungi and bacteria that live in soil and water.
5. Decomposers eat wastes from plants and animals. They break down these wastes into simple chemicals. This process usually releases some unpleasant gases.
6. These chemicals are used by green plants to make their food.
7. Most need clean air, clean water and shelter. Often the actions of people deprive living things of these necessities and upset the cycles of nature. This can harm not only the plants and animals, but it can also harm people.



# Let's Look at a Food Chain

Can you guess the answers to the following questions? Before you try, cover the answer column below with a piece of paper or fold the paper in half so you cannot see the answers. After you think about *your* answer to each question. Look at the answer that is given. Use the wheel to help you think about *your* answers.



## Questions

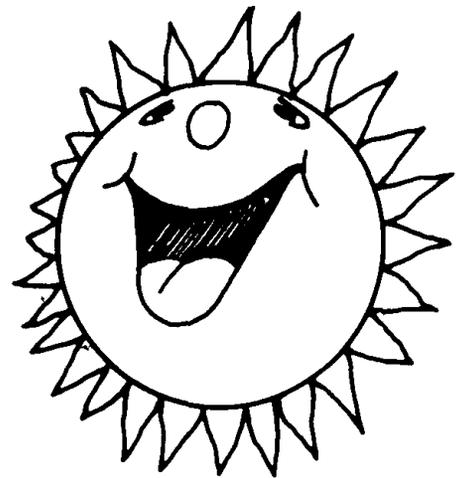
1. Move the slider so the words *green plants* show in the opening. What would happen if many green plants were killed.
2. Can you think of ways that green plants might be destroyed in great numbers.
3. Now move the slider so the words *plant eaters* shows in the notch. What might happen if great numbers of plant eaters were destroyed.
4. Now move the slider so the words *meat eaters* show in the notch. What might happen if great numbers if meat eaters were destroyed?
5. Small changes are always taking place in natural cycles like the food chain. These are usually not a problem because nature can adjust to small changes. Why then do we worry so much about the changes caused by pollution?
6. How can we decide if pollution caused by people will seriously upset a natural cycle?

## Answers

1. There would be no food for plant eaters.
2. They can be destroyed in great numbers by such things as forest fires, by weed killers, by people when they clear land to build on it, and by certain natural diseases.
3. There would be no food for the meat eaters. They would then either starve or have to move away.
4. If there were no meat eaters there would be too many plant eaters. They would then eat all the plants. As a result they would either starve or have to move away.
5. Many of the changes that pollution causes are *not small*. Pollution can destroy large numbers of plants or animals and seriously upset natural cycles.
6. Actions that affect a great number of plants or animals will seriously upset a natural cycle. Our actions should be as natural as possible. We should learn to live with nature since we are a part of it.



Activity 29  
Wildlife Conservation  
More Food Chains



**Subject Area:** Science

**Objective:** 1. The students will illustrate a food chain and present their ideas to the class.

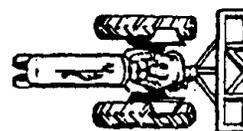
**Suggested  
Grade Level:** 3-4

**Background:** All organisms require a source of energy, and all organisms require certain raw materials of which the organism is composed. The source of energy for nearly all living organisms is the sun. Green plants, using raw materials from the air, water, and soil, convert a portion of the sun's energy which falls upon their leaves into food energy through the process of photosynthesis. That portion of energy which is not utilized by the plants for their own metabolism, is stored within plant tissues. This stored energy then becomes the source of food energy for all herbivores (plant-eating animals). The herbivores utilize a large portion of the energy acquired from the plants; the unused energy is stored within their animal tissues. Carnivores (meat-eating animals) then obtain their needed energy from that stored within the tissues of the herbivores or from omnivores (animals, including man, which eat both plant and animal tissue to obtain food energy). Some carnivores may also obtain a portion of their food energy from eating other, usually smaller, carnivores.

As food energy is transferred from plants to herbivores, and from herbivores to carnivores (or omnivores functioning as carnivores), there is a great degradation of energy into heat. The final user in the food chain dies. These raw materials are released back into the ecosystem by the action of decomposers and transformers (usually microorganisms) which obtain their energy from that which remained stored within the tissue of the dead organism.

As these decomposers and transformers extract the final bits of energy from the food chain, the residue comprises the original non-energy materials and returns to the soil.

This series of transfers of food energy from one organism to another is called a food chain or energy chain. Every food chain follows the same general pattern: green plants herbivore carnivore decomposers. Depending upon the organisms involved, a food chain may include one, two, or even three links of carnivores.

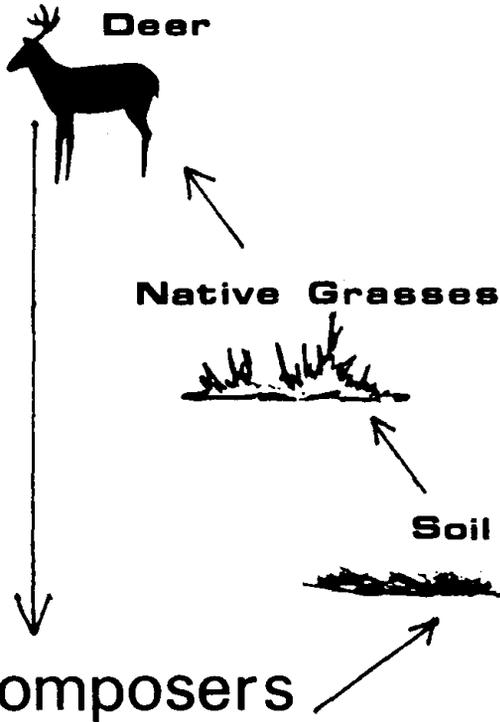


- Materials:**
1. Activity Sheet 1, made into a transparency.
  2. Plain drawing paper
  3. Blank acetate
  4. Markers
  5. Overhead projector
  6. White paper

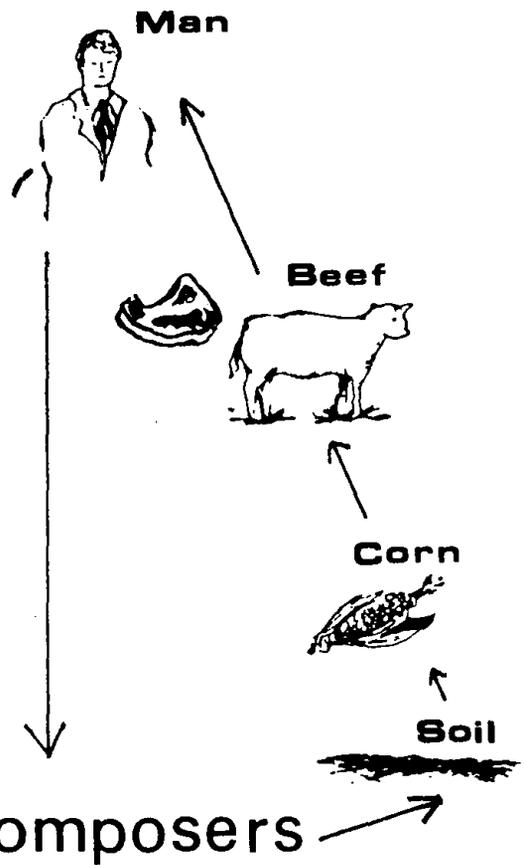
- Procedure:**
1. Discuss the food chain. Show examples on overhead (Activity Sheet 1). Discuss each step, writing new vocabulary on the chalkboard.
  2. Give a piece of paper to students grouped in pairs. Ask them to design their own food chain.
  3. Give each student group a piece of blank acetate and a marker. They must draw their own food chain on the acetate.
  4. Have each group present their food chain to the class using the overhead.
  5. Mount the student's transparencies on white paper and post in a bulletin board display.

# Food Chains

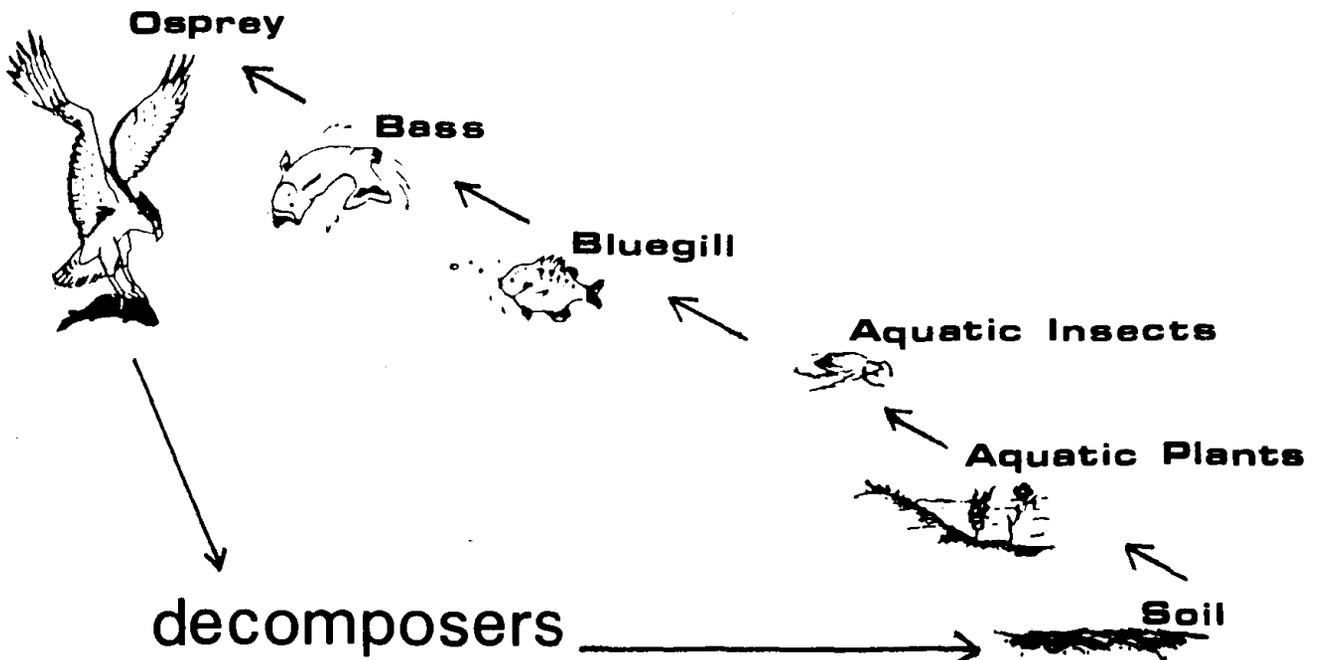
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2.



3.



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Activity 30  
Wildlife Conservation  
**Habitat Lap Sit**



**Subject Area:** Science

- Objectives:**
1. The students will be able to identify the components of habitat.
  2. The students will be able to recognize how humans and other animals depend upon habitat.
  3. The students will be able to interpret the significance of loss or change in habitat in terms of people and wildlife.

**Suggested  
Grade Level:** 3-4

**Background:** People and other animals share some basic needs. Every animal needs a place in which to live. The environment in which an animal lives is called "habitat". An animal's habitat includes food, water, shelter, and adequate space in an arrangement appropriate to the animal's needs. If any of these components of habitat are missing or are affected significantly so that the arrangement for the individual animal or population of animals is no longer suitable, there will be an impact. The impact will not necessarily be catastrophic, but can be. There are a great many additional limiting factors beyond those of suitable food, water, shelter, and space. For example, disease, predation, pollution, accidents, and climatic conditions are among other factors which can have an impact.

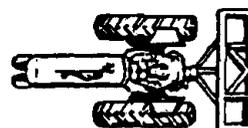


All things are interrelated. When we look at a biological community, we find interrelationships and interdependencies between plants and plants, plants and animals, as well as animals and animals. These interrelationships and interdependencies are important.

The major purpose of this activity is for students to become familiar with the components of habitat, and to recognize that it is not sufficient for there to be food, water, shelter, and space in order for animals to survive - those components of habitat must be in a suitable arrangement.

**Materials:** None needed.

- Procedure:**
1. Ask the students to number off from "one" to "four". All the "ones" go to one corner of the room, the "twos" to another, etc.



2. As the students move to their corners, clear a space in the center of the room. Better still, go outside to a clear, grassy area. The "ones" should sit or stand together, "twos" together, etc.
3. Assign each group a concept as follows: "ones" = food, "twos" = water, "threes" = shelter, "fours" = space.
4. Now, it's time to form a circle! This is done by building the circle in chains of food, water, shelter, and space. A student from each of the four groups walks toward the cleared area. The four students stand next to each other, facing in toward what will be the center of the circle. Four more students - one from each group - join the circle. Keep adding to the circle in sets of four until all the students are in the circle.
5. All students should now be standing shoulder to shoulder, facing the center of the circle.
6. Ask the students to turn toward their right, at the same time taking one step toward the center of the circle. They should be standing close together, with each student looking at the back of the head of the student in front of him or her.
7. Don't panic - this will work! Ask everyone to listen carefully. Everyone should place their hands on the waist of the person in front of them. At the count of three, you want the students to sit down ... on the knees of the person behind them, keeping their own knees together to support the person in front of them. You then say, "Food, water, shelter, and space - in the proper arrangement (represented by the students' intact, "lap-sit" circle) - are what is needed to have a good habitat.
8. The students at this point may either fall or sit down. When their laughter has subsided, talk with them about the necessary components of suitable habitat for people and wildlife.
9. After the students understand the major point - that food, water, shelter, and space are necessary for any animal's survival, and in their appropriate arrangement comprise a suitable habitat - let the students try the circle activity again! This time ask them to hold their lap sit posture. As the students lap-sit - still representing food, water, shelter, and space in their appropriate arrangement - identify a student who represents "water". Then say, "It is a drought year. The water supply is reduced by the drought conditions." At this point, have the student who was identified as representing "water" remove himself or herself from the lap-sit circle - and

watch the circle collapse, or at least suffer some disruption in arrangement. You could try this in several ways - removing one or more students from the circle. Conditions could vary: pollution of water supply, urban sprawl limiting availability of all components, soil erosion impacting food and water supplies, etc. Since animals habitat needs depend upon food, water, shelter, and space, in their appropriate arrangement, "removal" of any will have an impact.

10. Ask the students to talk about what this activity means to them. Ask the students to summarize the main ideas they have learned. They could include: a) food, water, shelter, and space, in their appropriate arrangement, can be called habitat; b) humans and other animals depend upon habitat; c) loss of any of these elements of habitat will have impact on the animals living there; and d) the components of habitat must be in an arrangement suitable to the needs of the individual animals or populations of animals in order for the animals to survive.

**Additional  
Activities:**

1. Worksheets 1-4, discuss more about habitats. Have students complete them then discuss.
2. Worksheets 5 and 6, discuss adaptation of animals and people concerning their habitat.

**Adapted  
From:**

1. Project WILD
2. Conservation for Children

We know that a 'habitat' is a place where plants and animals naturally live and grow. Every plant and animal has its own special habitat which provides food, water and shelter.

These habitats are part of even larger areas called 'biomes'. Each biome has a special climate, type of soil, and living conditions which provide habitats for certain plants and animals.

The forest is one biome. Evergreen trees, such as firs, spruce and pines grow in the forest biome. Animals, like deer, bears and squirrels are also found here.

The desert is another biome. Lizards, tortoises and some snakes make their home in this biome. Plants, like the cactus, grow well in the desert.

Other biomes include the grassland, cliffs, ocean, tropical forest and tundra.

The plants and animals below have been listed in the biome where their habitats are usually found. There is one mistake in each list. Cross out the name of the plant or animal whose habitat is not usually found in that biome.

**Desert Biome**

1. Tortoise
2. Cactus
3. Polar Bear
4. Camel

**Tundra Biome**

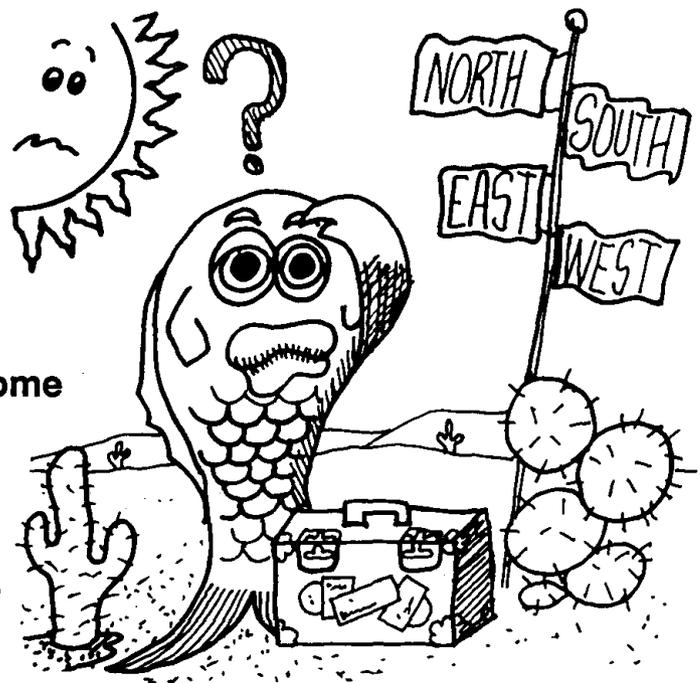
1. Penguin
2. Seal
3. Reindeer
4. Tiger

**Ocean Biome**

1. Whale
2. Cow
3. Seaweed
4. Eel

**Grassland Biome**

1. Dolphin
2. Rabbit
3. Blackbird
4. Rattlesnake



**Directions:** Use the chart to answer the questions below.

Animals move at different speeds for different reasons. A cheetah can run very fast to catch another animal for food. A snail crawls very slowly over a leaf to look for its food.

**How Fast Can These Animals Go?**

Lizard . . . . . 18 mph. (miles per hour)

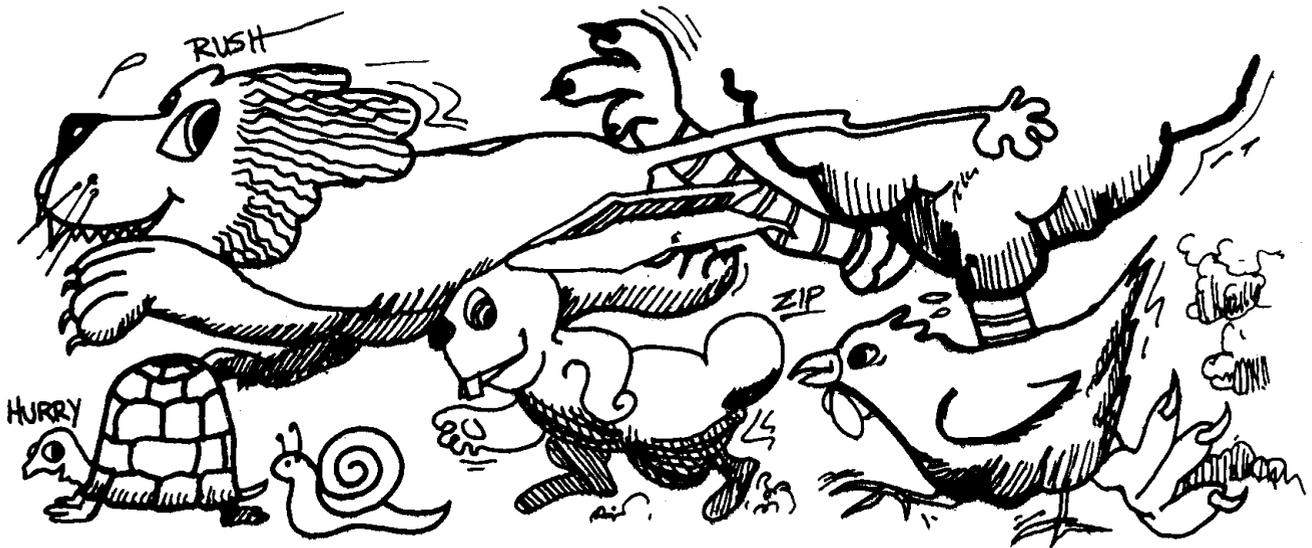
Cheetah . . . . . 63 mph.

Pronghorn Antelope . . . 55 mph.

Ostrich . . . . . 30 mph

Dolphin . . . . . 25 mph

1. Write the name of the fastest animal. \_\_\_\_\_
2. How much faster is the ostrich than the dolphin? \_\_\_\_\_
3. How much faster is the pronghorn antelope than the lizard? \_\_\_\_\_
4. How much faster is the cheetah than the pronghorn antelope? \_\_\_\_\_
5. Could the cheetah catch the dolphin? \_\_\_\_\_ Why or why not?  
\_\_\_\_\_





Rabbit Island is home for more than 20,000 rabbits. Changes are being made on the island which are causing problems for the rabbits.

**Directions:** read the problems to see what changes are being made. Do the work.

1. There are 325 acres on Rabbit Island. A farmer has bought 90 acres to grow corn. How many acres are left for the rabbits to live on?  
Color the farm area on the island.
2. A builder has bought 143 acres of the land that is left to build house on. Now how much of the island is left for the rabbits?  
Color the housing area on the island.
3. A shopping center is being built for the people who will live in the houses. The shopping center needs 48 acres of land for stores and parking. How many acres do the rabbits have now?  
Color the shopping center area on the island.
4. Roads were needed by the people. The roads took up 15 more acres. How many of the original 325 acres do the rabbits have now?  
Color in the road area.

325 acres on the island  
-90 acres for the farm

What do you think will happen to the rabbits?

Name \_\_\_\_\_ 

Doyle School  
10740 Wunderlich Ave.  
Cupertino, CA 95014

Sept. 18, 1990

National Wildlife Federation  
1412 16th St. , N.W.  
Washington, DC 20036

Dear Mr. Smith,

Last Tues. our class was talking about building a wildlife habitat in part of our school playground. We understand that you have a Backyard Wildlife Program which will provide directions. Please send us the information we will need.

Thank You,

The students in Rm. 15

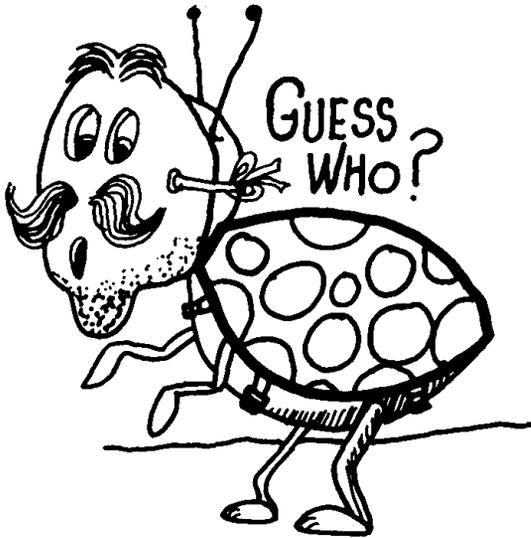
Write the words that have been abbreviated in the letter.

Ave. \_\_\_\_\_ CA \_\_\_\_\_

Sept. \_\_\_\_\_ St. \_\_\_\_\_

Mr. \_\_\_\_\_ Tues. \_\_\_\_\_

Rm. \_\_\_\_\_ N.W. \_\_\_\_\_



**Directions:** On the line at the right of each sentence write the adjective that describes the underlined noun.

**Adaptation**

1. The living things that have the greatest chance of survival are the ones that can adapt themselves to their surroundings.

\_\_\_\_\_

2. Some plants and animals change their color, body structure, or food habits to survive.

\_\_\_\_\_

3. These changes happen over a long period of time.

\_\_\_\_\_

4. The cactus is a good example of a plant that has adapted to changing temperatures.

\_\_\_\_\_

5. It can hold large amounts of water for a long time.

\_\_\_\_\_

6. This is why it can live in the hot desert where water is scarce.

\_\_\_\_\_

7. Moths that live in smoggy cities have been known to change their color from white to grey.

\_\_\_\_\_

8. This color change helps them to better hide from their enemies.

\_\_\_\_\_

9. Some animals have developed longer legs for running, sharper claws for digging or the ability to change colors.

\_\_\_\_\_

10. You are adaptable if you can change when various things around you change.

\_\_\_\_\_

**Adaptation**

Plants and animals must be able to adapt to live. This means that if their habitat changes, the plants and animals must adapt, or change, too.

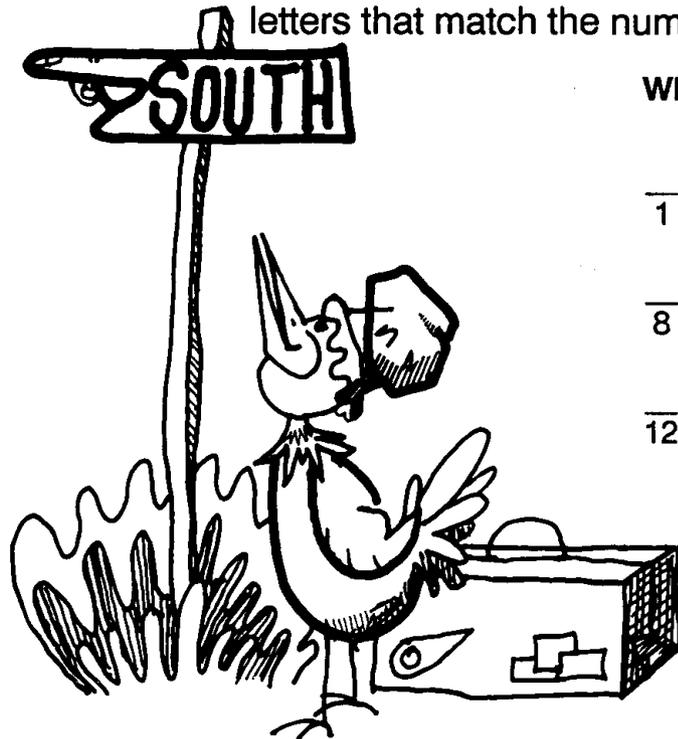
Some animals adapt by changing their habitat. For example, some birds live best in places where the weather is warm. If the weather changes and becomes cold, they can fly far away to another warm place.

Some animals adapt by changing what they eat. Seagulls can eat fish, but if there are no fish, they can eat many other things, too.

People can adapt by using their brains and hands to build or make things. If the weather gets cold, people can put on a coat or build a warm house.

People can adapt or change more than any other animal.

**Directions:** Find the answer to the silly riddle. Use the story to find the letters that match the numerals under the spaces.



**Why do birds fly south in the winter?**

$\overline{1}$   $\overline{2}$   $\overline{3}$   $\overline{4}$   $\overline{5}$   $\overline{6}$   $\overline{2}$        $\overline{7}$   $\overline{8}$   $\overline{6}$   
 $\overline{8}$   $\overline{9}$   $\overline{9}$        $\overline{10}$   $\overline{4}$   $\overline{11}$        $\overline{8}$   $\overline{9}$   
 $\overline{12}$   $\overline{4}$   $\overline{13}$   $\overline{14}$

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## Activity 31 Wildlife Conservation Habitat Rummy



**Subject Area:** Science, Language Arts

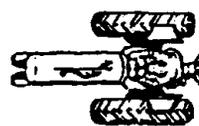
- Objectives:**
1. The students will be able to identify components of habitat as food, water, shelter, and space in a suitable arrangement.
  2. The students will be able to apply knowledge of these components to habitat requirements of various species of animals.
  3. The students will use reference materials to discover information about an animal.

**Suggested  
Grade Level:** 3-4

**Background:** The components of a habitat are food, water, shelter and space in a suitable arrangement.

- Materials:**
1. Writing paper and pencils
  2. Drawing paper
  3. Construction paper
  4. Scissors
  5. Glue
  6. Chalkboard

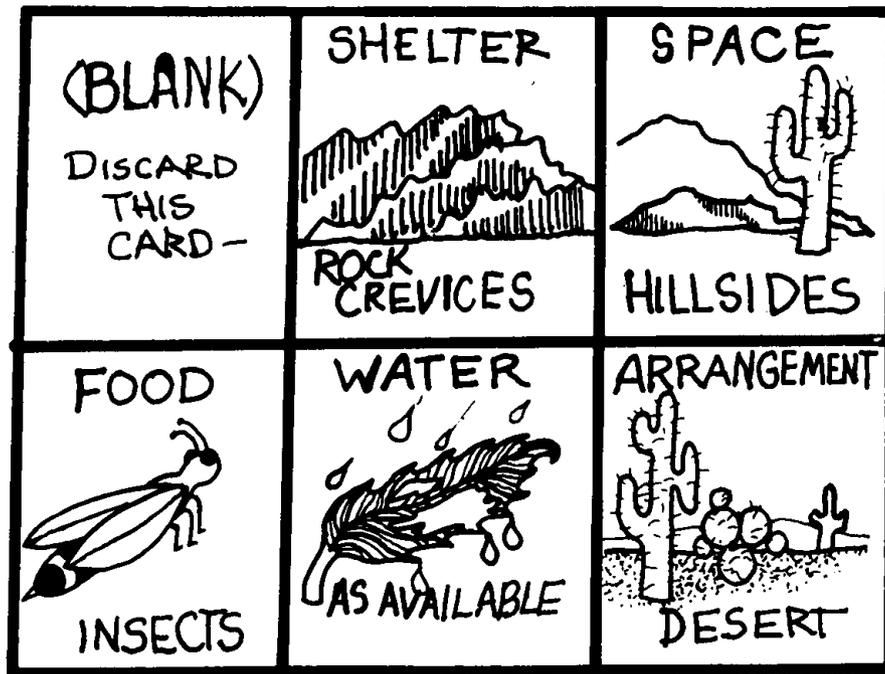
- Procedure:** Preparation of cards for game.
1. Assign students to groups of two or three. Ask each group to pick one animal they will research. Encourage a wide range of animals, including both wild and domesticated.
  2. Ask each group of students to use reference materials to research their animal. (You may need to instruct students in the use of the library. If library skills or references are a problem, students might be asked to choose from a list of animals for which you have classroom references). Included in their findings should be a listing of what each animal uses to meet the following needs: food, water, shelter, and space. They should also find out where the animal lives. For example, if a group of students picks a lizard, they might determine that most lizards eat insects as a water source because of their high moisture content; rest in rock crevices or trees for shelter; and use a hillside or sandy wash as a space in which to find food. The lizard might live in a desert environment.



3. Either you or the students make a large, master "Habitat Information Chart" which includes the major categories of information found by the students as follows:

Habitat Component	Animal				
	Lizard	Seagull	Bear	Chipmunk	Goshawk
Food	Insects	Fish	Insects Fish Berries Mammals	Seeds Berries	Small Mammals Birds
Water	Water	Water	Water	Water	Water
Shelter	Rock Crevices	Cliffs Sand Dunes	Caves	Burrows	Trees
Space	Hillsides	Ocean	Hills	Hillsides	Fields
Arrangement	Deserts	Aquatic	Woodland	Meadow Woodlot	Woodland Meadow

4. Once this information is on the master chart, make a smaller version on a copying machine. You can make six, equal-sized rectangles on each paper, with each paper including the habitat components needed for one animal. Once printed, these rectangles will serve as playing cards. Or, the students can transfer the information to 3x5 cards for use to play. See Figure below.



5. Make a copy of the sheet for every two to three students. (If you want every student to have a complete deck of cards to keep, print a copy of each sheet for every student.
6. Pass out a complete set of the card sheets to every group of students, along with heavy construction paper and glue. They can glue the printed sheets onto the five individual habitat cards per animal according to the printed stencil. Once cut, each set of five habitat cards make a "book".

#### **To Play Habitat Rummy:**

1. The object of the game is for a player to get five cards from one vertical column - or a complete set of habitat components for an animal - as listed on the master "Habitat Information Chart". The game ends when all "books" or complete sets of habitat components have been made, with the student having the most complete sets the "winner" of the game. Every group of two to three students playing the game uses one complete set of habitat cards and each group has a "winner". The give cards from one vertical column - or a complete set of habitat components for an animal - as listed on the master "Habitat Information Chart". The game ends when all "books" or complete sets of habitat components have been made, with the student having the most complete sets the "winner" of the game. Every group of two to three students playing the game uses one complete set of habitat cards and each group has a "winner". The game is based on luck, but the students become familiar with the habitat components for the animals involved as the game is played. The "Habitat Information Chart" must be in plain sight of the players.
2. The game begins as one student deals five cards to each of the players in his or her group. This happens simultaneously around the room, as all groups begin play. The first player - after dealing is complete - may discard an unwanted card and select another from the remaining deck, situated in the center of the circle of play. Play progresses around the circle with discarded cards being added to the leftover cards in the center (either face-up or face-down) and new cards being drawn, until one player gets a book - a complete set of five habitat components for an animal. (The master "Habitat Information Chart" serves as a reference in this process.) When a player does get a book, he or she yells

"HABITAT!" This process continues until all "habitats" are complete, and the student in each group with the most "books" or complete habitats is the "winner".

3. Ask students to summarize what they have learned.

Adapted  
From:

1. Project WILD

Activity 32  
Wildlife Conservation  
Going, Going, Gone



**Subject Area:** Language Arts, Science, Math

- Objectives:**
1. The students will become aware of many animals in Nebraska and the world that are endanger of being extinct, or threatened of becoming extinct or are extinct.
  2. The students will research and present information on an endangered animal.
  3. The students will complete addition and subtraction problems to discover two extinct animals of Nebraska.

**Suggested  
Grade Level:** 3-4

**Background:** Man has the responsibility for preserving wildlife for future generations. Solving the problems facing endangered and threatened species will help us in preventing a more secure species from becoming so rare that people no longer have the opportunity to enjoy the benefits it provides.

Once a wildlife species is lost, it cannot be replaced. Irregardless of the possible long-term effects, something of value is lost.

**New  
Vocabulary:** **Extinct:** Complete disappearance of a species.

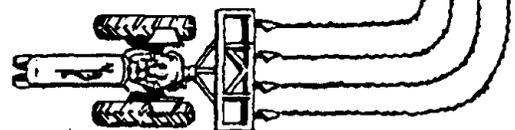
**Endangered:** Species in immediate danger of extinction.

**Critically Endangered:** Species will not survive without direct human intervention.

**Threatened:** Species present in its range, but threatened because of a decline in numbers.

**Rare:** Species not presently in danger, but of concern because of a decline in numbers. (Some species were always rare because of their position in the food chain or due to habitat preference.)

**Extirpated:** Any species that have disappeared from a state since 1800.



## Nebraska Endangered Species

Common Name	Location <sup>3</sup>
<b>Birds</b>	
* Bald Eagle	Entire
* American Peregrine Falcon <sup>1</sup>	Entire
* Arctic Peregrine Falcon	Entire
* Whooping Crane	Entire
* Eskimo Curlew <sup>2</sup>	Entire
<b>Mammals</b>	
* Black-footed Ferret	Entire
Swift Fox	Entire

\* Also on the United States Endangered List

<sup>1</sup> Existence of this subspecies in Nebraska is unconfirmed. Possibly occurs as a rare fall and winter migrant from adjacent western states.

<sup>2</sup> Last reported Nebraska sighting was made in 1926. Species may be very near extinction.

<sup>3</sup> Portion of Nebraska where endangered or threatened.

## Nebraska Threatened Species

Common Name	Location
<b>Birds</b>	
Interior least tern	Entire
Mountain plover	Entire
<b>Mammals</b>	
Southern flying squirrel	Entire
<b>Fish</b>	
Lake sturgeon	Entire
Pallid sturgeon	Entire
Northern redbelly dace	Entire
Pearl dace	Entire
Finescale dace	Entire
Brook stickleback	Entire

## Nebraska Extinct Species

Passenger Pigeon      Carolina Parakeet

## Nebraska Extirpated Species

Gray Wolf	Black Bear	Grizzly Bear
Wolverine	Otter	Mountain Lion
Mountain Sheep	Lake Chub	

Elk (Captive herds still present.) Several wild animals have moved to the north-western corner of NE from Wyoming.

Bison (Captive herds still present)  
Blackside Darter

- Materials:**
1. Chalkboard, Chalk
  2. Worksheets 1, 2, and 3
  3. Resource Materials

- Procedure:**
1. Write the word "extinct" on the chalkboard.
  2. Ask the students what they think this word means. Write the definition on the chalkboard for the students to understand easier.
  3. Go through the remaining new vocabulary in the same manner. (endangered, critically endangered, threatened, rare, and extirpated)
  4. Discuss the list of Nebraska animals that are extinct, endangered, threatened, and extirpated.
  5. Pass out copies of Worksheets 1, 2 and 3. Read directions and the paragraphs together and complete written work independently.
  6. Have students do a report on an endangered or threatened animal. A good length would be 10 to 20 sentences about the animal. (color, why endangered, where it lives, current population count, etc.) Have students present their information to the class.

- Additional Activities:**
1. Additional Worksheets

- Adapted From:**
1. Conservation for Children

## Endangered Animals

**Directions:** Read the story. Use the information to answer the questions.  
Be sure to write your answers as standard numerals.

The United States government began keeping lists of endangered and threatened wildlife in 1967. They now list one hundred seventy-four kinds of endangered animals and eleven more that are threatened.

Many of these animals are found in Nebraska. It is believed that there are now less than fourteen Black-footed Ferrets still alive. The Swift Fox population is low due to the changing conditions of grasslands to agricultural land in Western Nebraska.

Laws and wildlife management have helped some animals. For example, in 1956 there were about twenty-one Whooping Cranes alive. A national refuge was built to protect their habitat and, at last count, in 1980, there were more than ninety-nine birds alive.

**We can protect our wildlife.**



Answer these questions.

1. The United States government lists \_\_\_\_\_ kinds of endangered animals.
2. There are \_\_\_\_\_ more animals that are threatened.
3. There are less than \_\_\_\_\_ Black-footed Ferrets still alive.
4. The Swift Fox population is said to be \_\_\_\_\_.
5. The Whooping Crane population has grown from \_\_\_\_\_ in 1956 to \_\_\_\_\_ in 1980



## Endangered Animals

Many animals are in danger of becoming extinct. Extinct means that there are not (and never will be) any more of those animals. Dinosaurs are extinct animals.

Animals become endangered for many reasons. Some die because people have moved into places where they live. Then the animals have no place to find food or build their homes. Others are killed for their fur or skins to make coats and other clothing. Some animals are killed because people are afraid of them. Some are killed for sport by hunters.

Here are a few of the animals that are endangered. Draw a line from the animal to the reason you think it might be endangered.



### Cheetah

People have cut down the trees where this animal makes its home.

### Timber Wolves

This animal is killed by farmers to protect their herds of cattle and sheep.

### Pine Barrens Tree Frog

This animal is hunted for its beautiful fur. The fur is used to make coats.

### Elephants

These animals have been killed by eating poison that farmers spray on crops to kill insects. Fish eat plants that have the poison in them and then these animals eat the fish.

### Pelicans

People have moved into places where these animals live. They need a place of their own.

**Directions:** Do the problems. The letter under your answer will help you solve the code. Match your answer to the numbers under the blank spaces below. Write the correct letter on the space. You will find the names of two extinct animals in Nebraska.



$\begin{array}{r} 487 \\ +962 \\ \hline \end{array}$ <b>T</b>	$\begin{array}{r} 906 \\ +638 \\ \hline \end{array}$ <b>L</b>	$\begin{array}{r} 697 \\ -489 \\ \hline \end{array}$ <b>O</b>	$\begin{array}{r} 321 \\ +598 \\ \hline \end{array}$ <b>R</b>	$\begin{array}{r} 987 \\ -354 \\ \hline \end{array}$ <b>N</b>	$\begin{array}{r} 546 \\ +293 \\ \hline \end{array}$ <b>S</b>	$\begin{array}{r} 638 \\ -389 \\ \hline \end{array}$ <b>A</b>
$\begin{array}{r} 423 \\ +117 \\ \hline \end{array}$ <b>K</b>	$\begin{array}{r} 328 \\ +169 \\ \hline \end{array}$ <b>C</b>	$\begin{array}{r} 469 \\ -135 \\ \hline \end{array}$ <b>I</b>	$\begin{array}{r} 596 \\ -444 \\ \hline \end{array}$ <b>G</b>	$\begin{array}{r} 6,856 \\ -6,828 \\ \hline \end{array}$ <b>E</b>	$\begin{array}{r} 7,846 \\ -5,388 \\ \hline \end{array}$ <b>P</b>	$\begin{array}{r} 6,487 \\ +1,269 \\ \hline \end{array}$ <b>B</b>

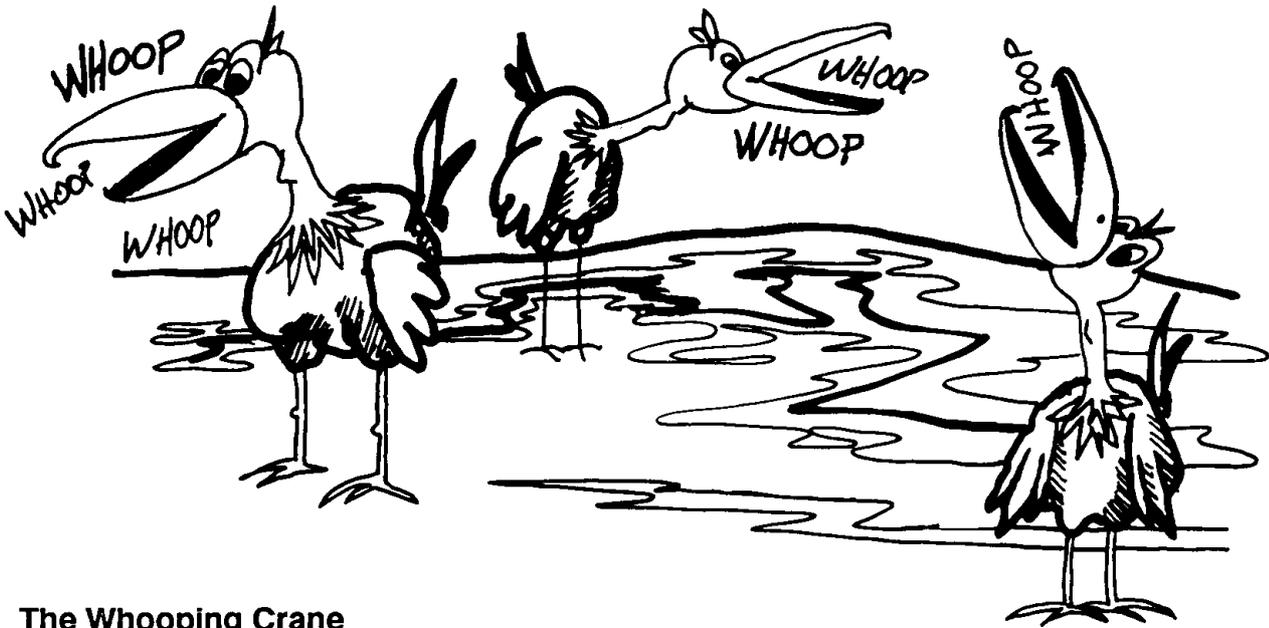
$$\begin{array}{r} \overline{2458} \quad \overline{249} \quad \overline{839} \quad \overline{839} \quad \overline{28} \quad \overline{633} \quad \overline{152} \quad \overline{28} \quad \overline{919} \end{array}$$

$$\begin{array}{r} \overline{2458} \quad \overline{334} \quad \overline{152} \quad \overline{28} \quad \overline{208} \quad \overline{633} \end{array}$$

and the

$$\begin{array}{r} \overline{497} \quad \overline{249} \quad \overline{919} \quad \overline{208} \quad \overline{1544} \quad \overline{334} \quad \overline{633} \quad \overline{249} \end{array}$$

$$\begin{array}{r} \overline{2458} \quad \overline{249} \quad \overline{919} \quad \overline{249} \quad \overline{540} \quad \overline{28} \quad \overline{28} \quad \overline{1449} \end{array}$$



### The Whooping Crane

The whooping crane is an endangered species. Thirty years ago there were only 21 whooping cranes alive in the world. In 1980 the number had grown to 99. Some people who cared about the whooping crane got laws passed to protect the cranes' winter home in Texas. They also began taking some eggs from the wild cranes and raising the baby chicks.

Whooping cranes usually lay two eggs at a time, but only one chick grows up. The babies fight, and the stronger chick steals the food from the weaker one. To stop this, scientists keep baby cranes in pens with baby turkeys. During fights, the turkeys can outrun the cranes and they don't get hurt. Sometimes scientists put whooping crane eggs into the nests of other birds. These different birds will raise the baby whooping crane as their own.

People who care may be able to save the whooping crane from becoming extinct.

### Write "yes" or "no" after each sentence.

1. The whooping crane is an endangered species. \_\_\_\_\_
2. The cranes' winter home is in California. \_\_\_\_\_
3. Sometimes whooping crane chicks are raised with turkeys. \_\_\_\_\_
4. Whooping cranes got laws passed to protect their winter homes. \_\_\_\_\_
5. There are more whooping cranes alive today than 30 years ago. \_\_\_\_\_

### Endangered Animals

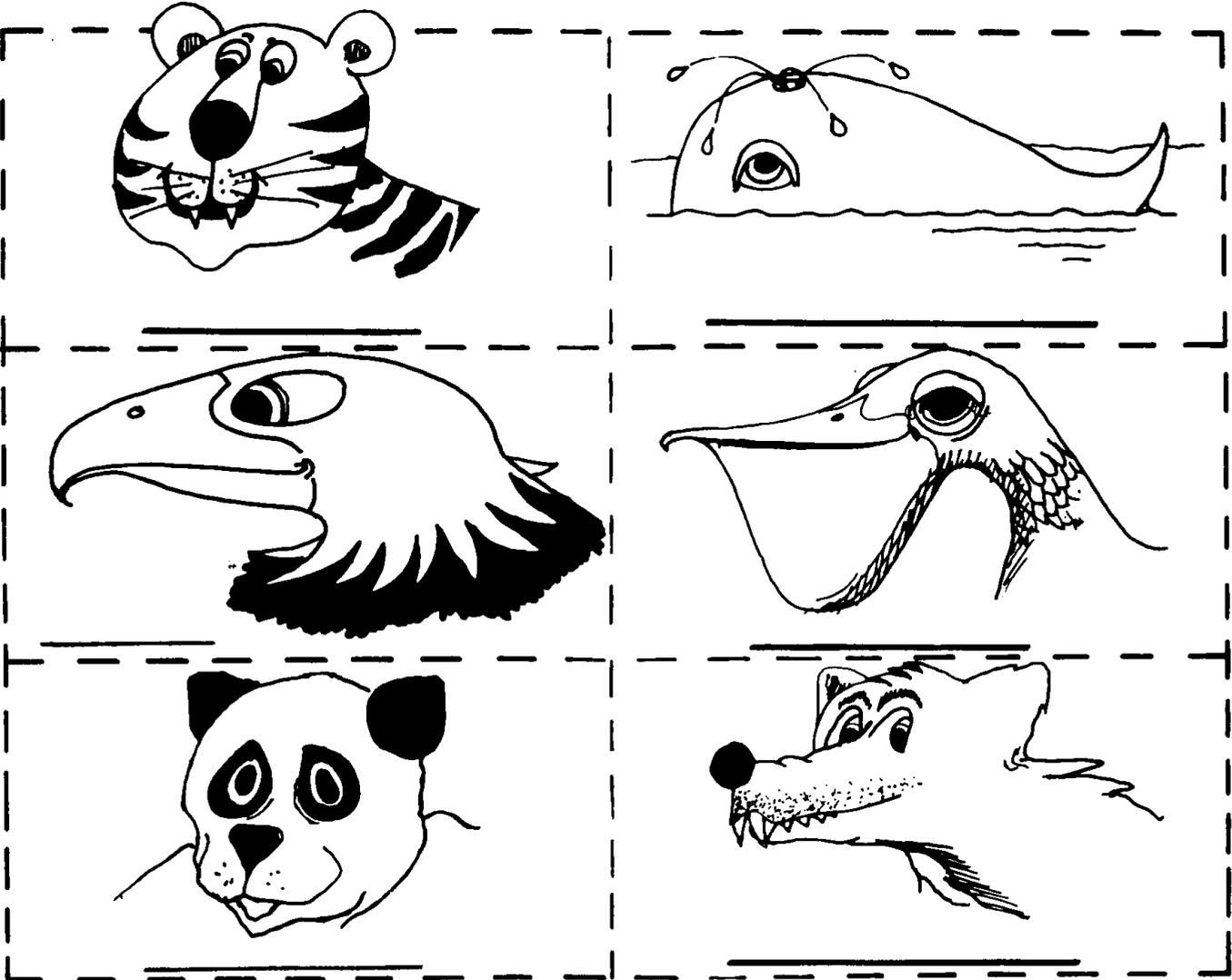
Some animals are endangered. This means that there aren't many left. Some animals are endangered because the weather changes, they can't get enough food or water, or their habitat is destroyed. Sometimes, people kill too many animals and they become endangered.

**Directions:** Write the names of these endangered animals on the spaces under the picture.

Blue Whale  
Brown Pelican

Timber Wolf  
Bald Eagle

Tiger  
Panda Bear



**Directions:** Read the story. Below the story are some new words. Draw a line from the word to its meaning.

### Endangered Animals

Many animals are close to extinction today. There are many reasons why this is so. Some animals have decreased in number for hundreds of years due to changes in climate and vegetation. For example, the giant panda and the whooping crane are both rare probably for these reasons. Other animals such as the North American bison and the tiger are rare because of senseless and destructive hunting. Probably most endangered animals are threatened because of man moving into the places in which they live.

For example, when the first settlers were moving across America's "Wild West", the herds of bison (or buffalo, as they are sometimes called) seemed limitless. There were probably sixty million bison roaming the plains in herds that often had several thousand animals. As the settlers spread across the prairies, the hunters went ahead. Sometimes they were employed to supply meat for workmen on the railroads, but often the slaughter was far greater than was needed. At that time it seemed that the bison would last forever- but by the beginning of this century there were only a few hundred left throughout America. By careful conservation, man has now managed to re-establish several large herds, and in the National Parks of Canada and the U.S.A. these magnificent animals can once more be seen.

decreased

vegetation

rare

senseless

limitless

employed

slaughter

conservation

magnificent

plant life, growing plants

never ending

protecting from loss or being used up

became less

splendid; grand; wonderful

foolish; stupid

unusual, seldom seen or found

give work and pay

killing; butchering

**Directions:** Read the story. Find the words below in the story and draw a line under them. Write the words in alphabetical order on the spaces below the story.

disappear      crocodiles      species      entire  
pandas      extinct      destruction      people  
societies      continue

---

### Disappearing Animals

Animals are always changing. Just as new ones appear, so other disappear. Some, like the crocodile, have remained the same for millions of years, while others are changing rapidly. In the last few hundred years, man has spread out over the whole world. In doing so, he has killed millions of animals. Some have been killed for food, some because they were pests, some for sport, and some for their furs.

Man has also wiped out entire species of animals. Once a species is extinct, there will never be any more.

More and more people are becoming aware of this and trying to stop the destruction of wildlife. Societies like the World Wildlife Fund buy land where animals can live in peace. Governments protect animals so that their people can enjoy seeing them. Wild animals should be for everyone, not just for a few hunters.

If we want to continue to see leopards, tiger, pandas, crocodiles and other animals, we must make sure that they do not become extinct.

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_
6. \_\_\_\_\_
7. \_\_\_\_\_
8. \_\_\_\_\_
9. \_\_\_\_\_
10. \_\_\_\_\_



**Directions:** Read the story. At the bottom of the page, underline the best sentence that tells the main idea of each paragraph.

### Birds of Prey

(1) America's birds of prey, such as eagles, hawks and owls, are in trouble. Several species are now "endangered". There are three main causes of the trouble.

(2) Pesticides have been sprayed on many of our farm crops. Some of these chemical poisons have passed through nature's food chain and ended up in birds' bodies. This has caused some birds to stop laying eggs. Other birds lay eggs with shells so thin that the eggs break when the parent bird sits on them.

(3) Thoughtless people have also killed many adult birds or destroyed their nests. These people often thought that the birds were pests and that they were eating the crops. But, birds of prey are really the farmers' friends. they eat mice, rabbits and other small animals that can destroy crops.

(4) People have also destroyed the birds' habitats. They have built houses, factories and highways where the birds live. They have also dug mines, cut forests and plowed the lands where the birds naturally nest and hunt.



Birds of prey are important to the balance of nature.  
We all need to work together to protect these birds.

#### Paragraph 1

- A. Eagles are birds of prey.
- B. Many birds of prey are in trouble
- C. Parrots are an endangered species.

#### Paragraph 2

- A. Some birds lay thin-shelled eggs.
- B. DDT is a pesticide.
- C. Pesticides are dangerous to birds.

#### Paragraph 3

- A. Many birds are killed by people.
- B. Birds eat mice and rabbits
- C. Farmers grow many crops.

#### Paragraph 4

- A. People cut down forests for timber.
- B. Birds don't like factories.
- C. Many bird habitats have been destroyed by people.

**Directions:** Read the story. Draw a line under all the number words.  
Answer the questions at the bottom of the page.

### The Giant Panda

The giant panda is probably the rarest of all animals. Although the panda looks like a bear, it is actually related to the raccoon. It can only be found in one place in all the world – the bamboo jungles between China and Tibet. Perhaps it is called "giant" because it grows to a weight of three hundred pounds and a length of five feet. It is an endangered animal mostly because of over-hunting and the many numbers who have been caught for zoos. In 1936, the first live giant panda brought to the United States weighed only five pounds. It cost nearly nine thousand dollars. Fifteen months later, the giant panda, "Su-Lin" died at the Brookfield Zoo in Chicago.



Use the story to answer the questions. Write your answers as standard numerals.

1. How much can a grown giant panda weigh? \_\_\_\_\_
2. How tall does a giant panda get to be? \_\_\_\_\_
3. How much did the first giant panda cost the zoo? \_\_\_\_\_
4. How long did the giant panda live at the zoo? \_\_\_\_\_



Many plants and animals cannot live where there are lots of people. As people build more and more houses and roads, the animals must move. Often, when animals are forced to leave their natural habitats, they die.

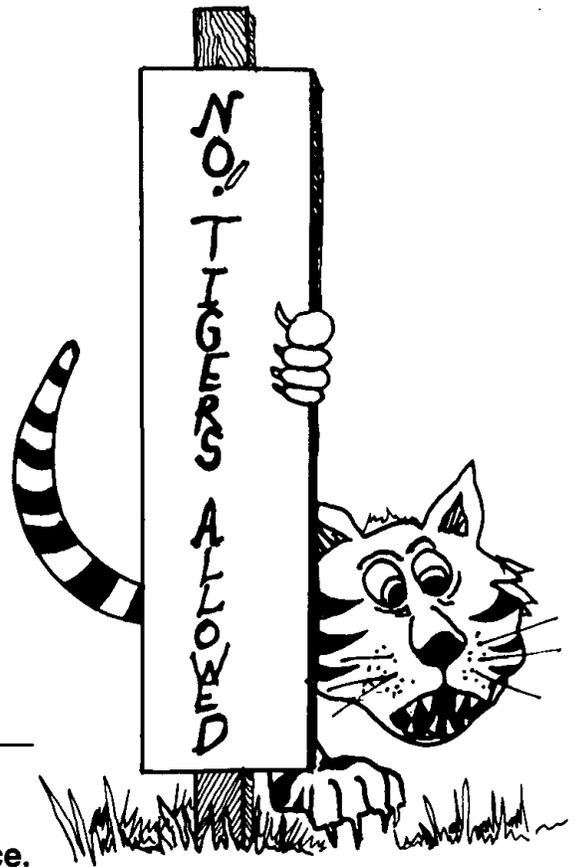
**Directions:** Use the sign to fill in the blanks.

1. The fourth letter of the second word \_\_\_\_\_
2. The first letter of the first word \_\_\_\_\_
3. The last letter of the last word \_\_\_\_\_
4. The first letter of the third word \_\_\_\_\_
5. The same as number 2 \_\_\_\_\_
6. The third letter in the second word \_\_\_\_\_
7. The sixth letter in the third word \_\_\_\_\_
8. The fifth letter in the second word \_\_\_\_\_
9. The letter before the fifth letter in the second word \_\_\_\_\_
10. The fifteenth letter in the phrase \_\_\_\_\_

**Use the letters in the blanks to complete the sentence.**

When there are very few of a kind of plant or animal left alive, we say they are

\_\_\_\_\_





Jerry lives on a small farm. Houses have been built on the lands around the farm. Jerry has made a chart to show how many animals lived near the farm before the houses were built. His chart also shows how many of these animals are living near the farm now.



**Directions:** Jerry wrote the numbers as Roman numerals. His chart would be easier to read if the numbers were written in standard notation. Change the Roman numerals to standard notation. Write the numerals on the blank spaces.

### Animals Near the Farm

Animal	Before the houses were built	After the houses were built
Beavers . . . . .	XX _____	XI _____
Coyotes . . . . .	VI _____	II _____
Raccoons . . . . .	XII _____	VII _____
Rabbits . . . . .	IX _____	XVI _____
Deer . . . . .	V _____	I _____
Field Mice . . . . .	VII _____	XVIII _____
Foxes . . . . .	XIV _____	III _____

Are there more of some animals since the houses were built?

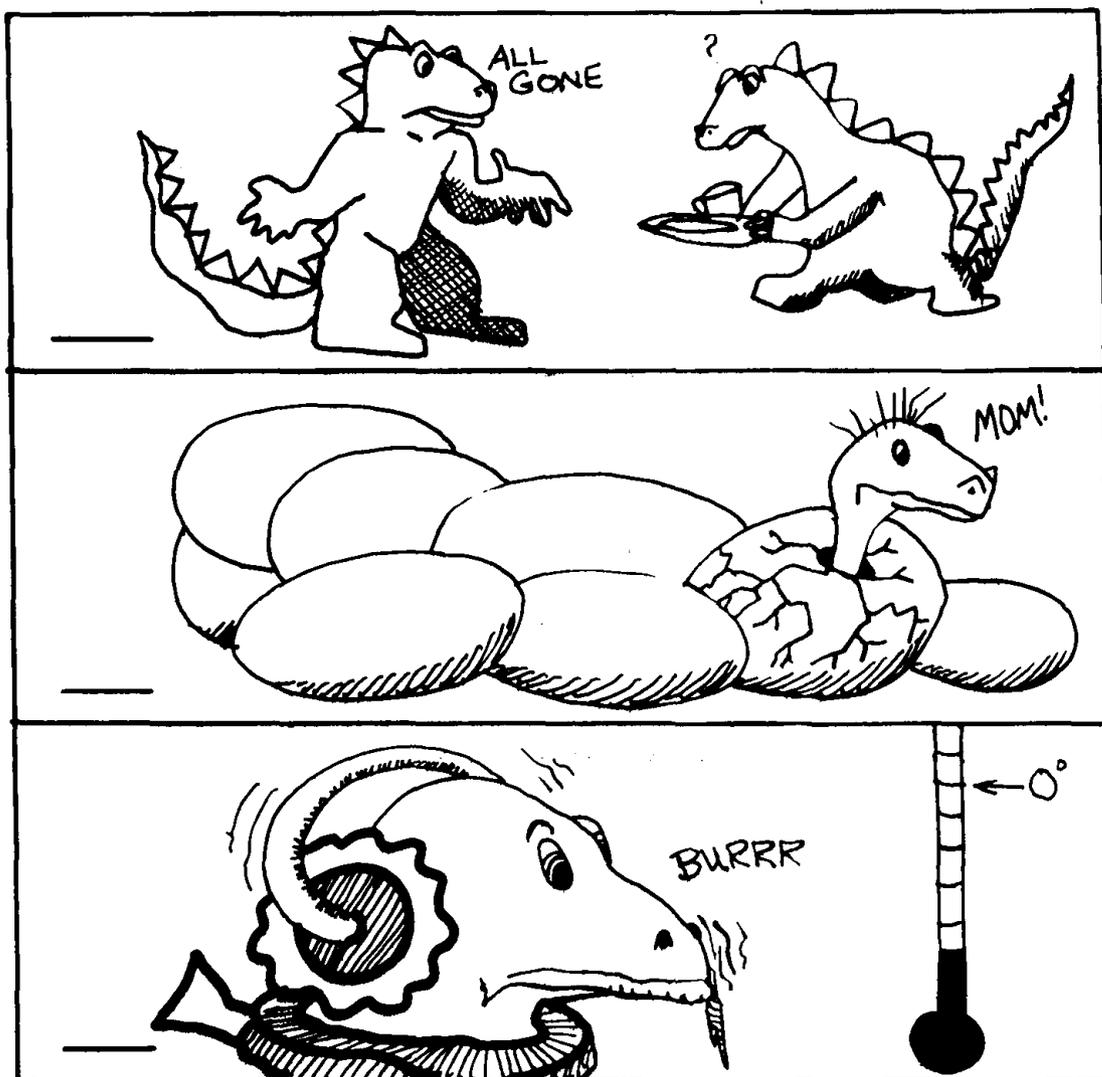
Can you think of a reason why?

## Extinct Animals

Animals or plants that once lived on the earth, but are no longer alive are called extinct. Dinosaurs are a good example of animals that are extinct. Dinosaurs were large lizards that lived in warm places. They needed lots of food, water and space to survive.

**Directions:** Match the picture to the sentence that tells why dinosaurs became extinct. Write the numeral of the sentence under each picture. Color the pictures.

1. There was not enough food or water.
2. The climate became too cold.
3. Few baby dinosaur eggs hatched.



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## Activity 33 Wildlife Conservation Pollution Hurts



**Subject Area:** Math, Art, Science

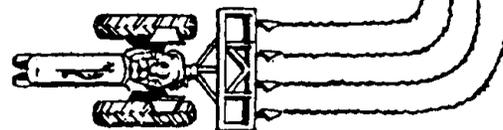
- Objectives:**
1. The students will be aware of pollution in nature.
  2. The students will learn how he/she can help control and prevent pollution.
  3. The students will solve story problems about litter.
  4. The students will create a new character and design a slogan to help prevent littering.

**Suggested  
Grade Level:** 3-4

**Background:** What does the word pollution mean? One good definition says that pollution is the disturbance of a natural resource so it can no longer be used by man or by nature. This definition says that not only do we harm nature when we pollute, but we harm ourselves as well. Pollution itself is not really the problem. The person that does or helps in polluting is the source of the problem. Like it or not the problem is with the people of the planet so let's start with the first person you can work with: YOU!

Pollution of the water takes place in many forms. There is chemical pollution from factories, sewage from cities and waste and chemical runoff from farming. This pollution disturbs the communities and natural balance of the environment causing there to be large holes in the many cycles. We've seen that all natural systems depend on each part of themselves to work in the environment. A lake or river that is used as a dumping ground for chemical, or solid wastes will soon become disrupted to the point of no return. So what can we do as ordinary people to help stop this destruction by pollution? The first thing is be aware of the problems, only then can you work on them. After you are aware of the reasons for the pollution try to avoid being a source. Little things like biodegradable soap that can be easily broken down in the water and "phosphates and nitrate free soaps" that don't cause water pollution can help out quite a bit. Campaign in your neighborhood for environmental "awareness" and then tell people the reasons why they should be selective in their soap and detergent purchases.

Air pollution is a big problem throughout all of our country and comes in many forms. There is pollution from factories that make our material needs, pollution from cars and trucks that take us to places where we want to go and



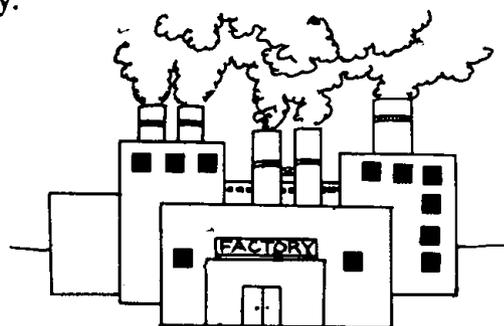
pollution from power plants that supply us with our electrical power. Again we find ourselves at the root of the problem.

Air pollution of many types harms plant growth and causes natural unbalance in the environment. Plants, we know, are the most important members of all food chains and many cycles. With this harming of plants we in turn harm all of nature.

Not only does air pollution cause problems in our natural environment but we find that it affects our human environment as well. Air pollution causes faster deterioration of houses and buildings. We find that it not only causes damage to the things around us but that it damages our body as well! Air pollution is a big source of disease in this country.

**Materials:**

1. Sheets of waxed paper
2. Pencils and rulers and paper
3. Vaseline
4. Thumb tacks
5. Construction paper
6. Crayons, paint or markers
7. Worksheets 1 and 2



**Procedure:**

1. Have students cut out small pieces of waxed paper (2" x 2") and apply a coating of Vaseline on them. Then place them in areas around the school or their community by tacking them to trees, light poles, etc. Let the papers collect air pollutants for 2 days and have the students bring them back into the class. It is useful to discuss the types of air pollutants found and where the paper was placed. Did some of the papers get more air pollution than others? Why? What are the types of air pollution in the community? How can you help fight pollution in your community?
2. Have the students complete Worksheet 1.
3. Smokey Bear tells people about fires. Woodsy Owl says "Give a hoot, don't pollute." Have each student design a new character to remind people to stop polluting and use water wisely. (e.g., animal, robot, creature from out of space, a super person) Have students use throw-away items, such as pop-tops, styrofoam, spoons, buttons, plastic bottles, etc., to make a model of their character. What will your character do or say to stop pollution.
4. Have students read, the top of the Worksheet 2 together and then work to complete page.

**Additional  
Activities:**

1. Prepare a T.V. commercial about preventing air, water, or land pollution. Videotape the commercials if you have access to the equipment.
2. Have students design badges to help remind people to use water and nature wisely.
3. Have a "We Care About Nature" day at school. Make posters and badges to promote conservation.
4. Have a wildlife expert join you as a guest speaker.
5. Worksheets 3-12.

**Adapted  
From:**

1. Learning with Otis

## Humans Have Polluted Their Environment in Many Different Ways.

Put numbers in front of each set of sentences to show the order in which they happen.



- \_\_\_\_\_ People began spraying poison on crops to kill the insects.
- \_\_\_\_\_ Insects ate many crops.
- \_\_\_\_\_ Poisons also killed birds and other animals that ate the insects.

- \_\_\_\_\_ The animals that live in the streams and rivers began to get sick and die.
- \_\_\_\_\_ Some factories pour used, dirty water back into the streams and rivers.
- \_\_\_\_\_ Factories were built to make more things for people.



- \_\_\_\_\_ People made more and more cars.
- \_\_\_\_\_ Fumes from cars put poisons into the air.
- \_\_\_\_\_ Trees and plants in the cities began to get sick and die.



- \_\_\_\_\_ Litter is not nice to look at and can hurt animals.
- \_\_\_\_\_ More people made more litter.
- \_\_\_\_\_ There are many more people on the earth today.



Name \_\_\_\_\_



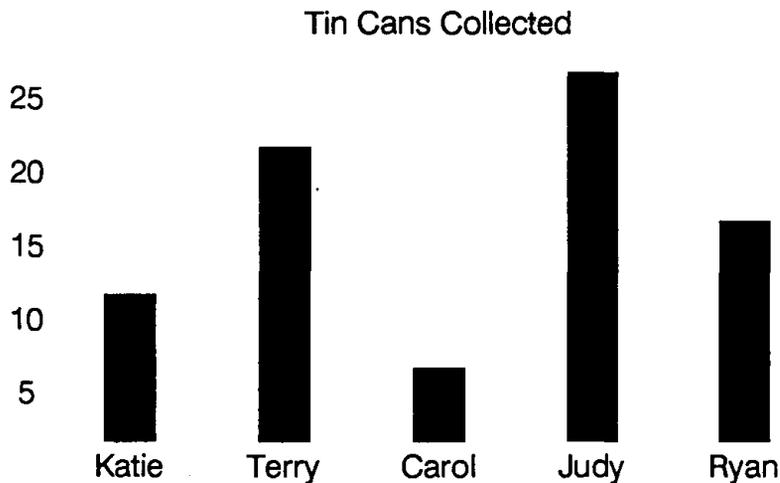
Mrs. Black's class has just read a booklet called "Deadly Throwaways". It told them some reasons why litter is harmful to animals. Here are some things they learned. Birds can get hung up in strings. Animals can choke on pop tops and plastic wraps. Small animals can fall into bottles or cans. If they can't get out they are either fried, frozen or starved to death. Garbage that is thrown out of cars attracts animals to the highways where they can get hit by passing cars. Litter can really be dangerous for animals. To help fight litter the students decided to have a clean-up day. They formed groups to pick up litter in the neighborhood.



**Read the problems. Solve the problems, read carefully!**

1. Mike, Sam and Jake walked for about one mile while they picked up pop cans. Mike found 5 more than Sam who found 18. Jake collected 8 less than Mike. How many cans did the boys collect all together?
2. Sherri, Chris and Pat picked up papers and other litter. Sherri and Chris **each** filled 4 bags. Pat and Sherri **each** filled 3 bags. Chris filled one extra bag on the way back to school. How many bags were filled?

Study this graph:



3. Who collected the most?
4. Who collected the least?
5. Who collected more than Katie but less than Terry?
6. How many did the top 3 can collectors collect in all?
7. In all, how many did the group collect?
8. Who collected more, Terry and Ryan or Carol and Judy?  
By how many?

**Directions:** Draw a line under the contraction in each sentence.

Write the two words that mean the same as the contraction on the blank spaces.

1. Trash isn't nice to see in parks or playgrounds. \_\_\_\_\_
2. Don't throw litter on the ground. \_\_\_\_\_
3. Papers and trash aren't good for plants or animals. \_\_\_\_\_
4. If you can't find a garbage can, take your trash home with you. \_\_\_\_\_
5. It wouldn't be fun to play in a park covered with litter. \_\_\_\_\_

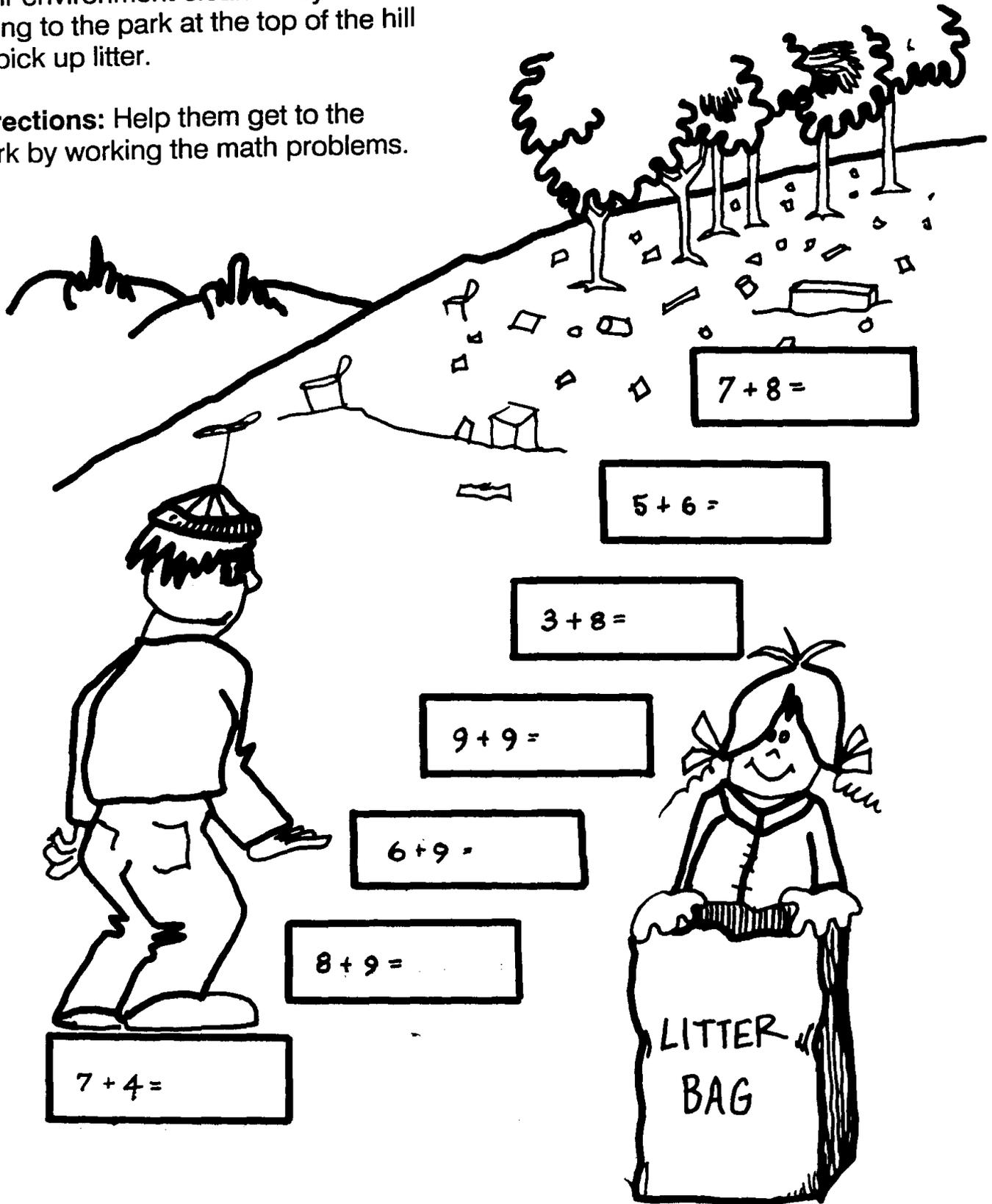
Color the picture. Color over the parts that are not nice to see.



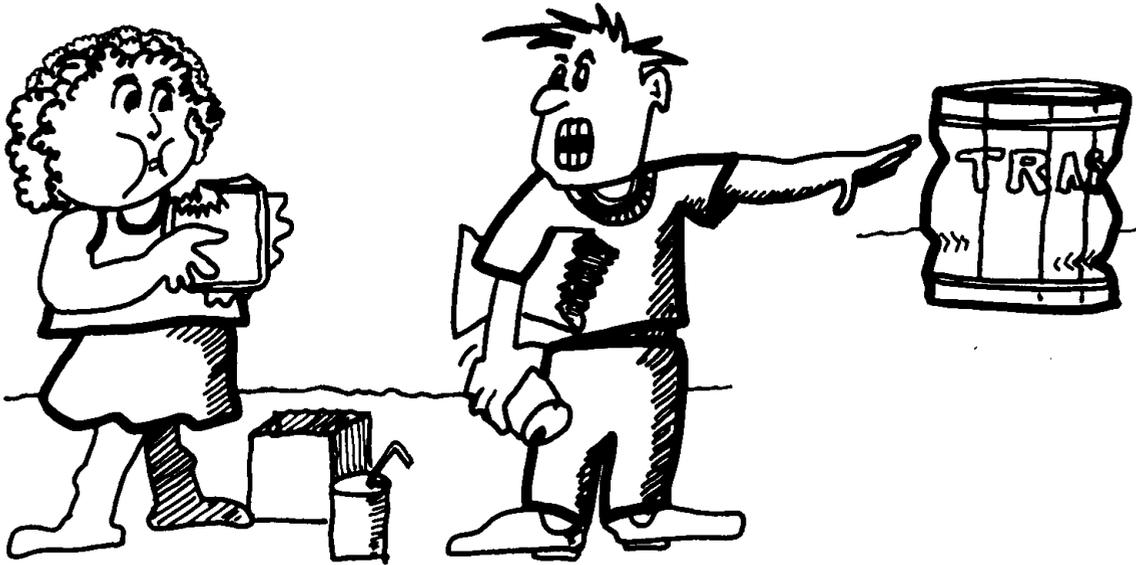


Johnny and Susie want to help keep their environment clean. They are going to the park at the top of the hill to pick up litter.

**Directions:** Help them get to the park by working the math problems.



Read the story. Number the sentences 1, 2, 3 and 4 the way they happened in the story.



Mike and Melissa went to the park. They were going to have a picnic. They brought peanut butter and jelly sandwiches, cookies and two cans of soda.

After they ate their lunch, Melissa wanted to play on the swings. Mike thought they should put their trash in the trash can first. Melissa did not want to be a litterbug, so they picked up the trash. Then they played on the swings.

\_\_\_\_\_ They ate peanut butter and jelly sandwiches for lunch.

\_\_\_\_\_ Mike and Melissa went to the park for a picnic.

\_\_\_\_\_ They played on the swings.

\_\_\_\_\_ They put their papers and cans in the trash can.



# What does Woodsy Owl say?



**Directions:**  
Do the problems.  
Use your answers to find out.

E	$\begin{array}{r} 43 \\ +8 \\ \hline \end{array}$	H	$\begin{array}{r} 72 \\ +9 \\ \hline \end{array}$	T	$\begin{array}{r} 84 \\ +4 \\ \hline \end{array}$	I	$\begin{array}{r} 46 \\ +8 \\ \hline \end{array}$
P	$\begin{array}{r} 83 \\ +7 \\ \hline \end{array}$	O	$\begin{array}{r} 44 \\ +2 \\ \hline \end{array}$	V	$\begin{array}{r} 92 \\ +8 \\ \hline \end{array}$	A	$\begin{array}{r} 35 \\ +7 \\ \hline \end{array}$
D	$\begin{array}{r} 96 \\ +5 \\ \hline \end{array}$	N	$\begin{array}{r} 28 \\ +8 \\ \hline \end{array}$	L	$\begin{array}{r} 46 \\ +9 \\ \hline \end{array}$	U	$\begin{array}{r} 79 \\ +7 \\ \hline \end{array}$

**G**

\_\_\_\_\_  $\begin{array}{r} 54 \\ \hline \end{array}$   $\begin{array}{r} 100 \\ \hline \end{array}$   $\begin{array}{r} 51 \\ \hline \end{array}$   $\begin{array}{r} 42 \\ \hline \end{array}$   $\begin{array}{r} 81 \\ \hline \end{array}$   $\begin{array}{r} 46 \\ \hline \end{array}$   $\begin{array}{r} 46 \\ \hline \end{array}$   $\begin{array}{r} 88 \\ \hline \end{array}$

$\begin{array}{r} 101 \\ \hline \end{array}$   $\begin{array}{r} 46 \\ \hline \end{array}$   $\begin{array}{r} 36 \\ \hline \end{array}$   $\begin{array}{r} 88 \\ \hline \end{array}$   $\begin{array}{r} 90 \\ \hline \end{array}$   $\begin{array}{r} 46 \\ \hline \end{array}$   $\begin{array}{r} 55 \\ \hline \end{array}$   $\begin{array}{r} 55 \\ \hline \end{array}$   $\begin{array}{r} 86 \\ \hline \end{array}$   $\begin{array}{r} 88 \\ \hline \end{array}$   $\begin{array}{r} 51 \\ \hline \end{array}$  !

Name \_\_\_\_\_ 

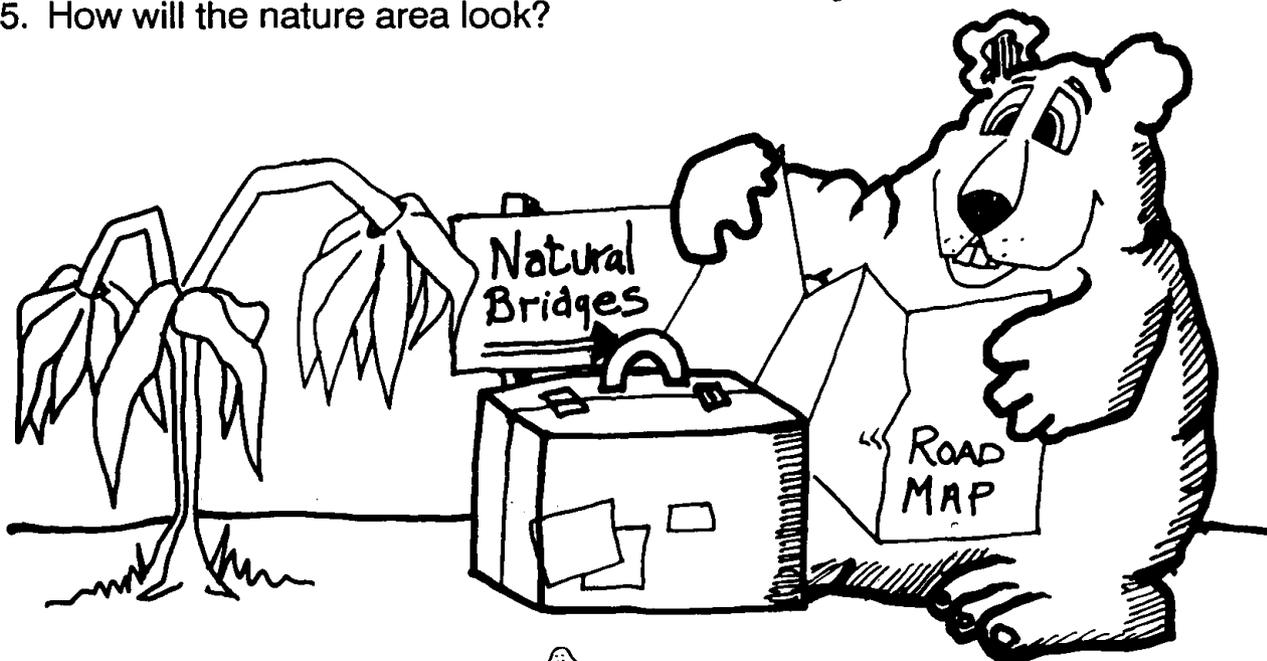
Many parks and natural areas have signs telling people that it is against the law to take rocks, plants or animals home with them.

Some people think that one little rock, flower or starfish isn't going to be a big deal. Is it?



**Directions:** Do the word problems to see what could happen if everyone thought that way.

1. Three classes of students visit Natural Bridges nature area every day. Each class has 30 students. If each student takes home just one little rock, how many little rocks will be gone in one day?
2. How many little rocks will be gone in one week (7 days)?
3. How many little rocks will be gone in one month (30 days)?
4. How many little rocks will be gone in one year (12 months)?
5. How will the nature area look?



**Directions:** Draw a line under the compound words you find in the story. Write them on the blank spaces below. Draw a line between the two words that form the compound word.

Many people are working hard to help our environment. They are asking our Congressmen to pass laws to protect our wildlife and prevent pollution.

You may know that you can go to jail or pay a fine if you litter our highways. There are also laws against making too much noise and polluting your neighbor. We have laws requiring licenses for fishing and hunting. The money from these license fees is sometimes used to restock rivers and lakes with fish, to replant trees and shrubs along the roadsides, and to make improvements in parks and campgrounds. Laws also limit lumber companies in the amount of redwood trees that they can cut.

Taking care of our environment is a responsibility for everyone.

\_\_\_\_\_

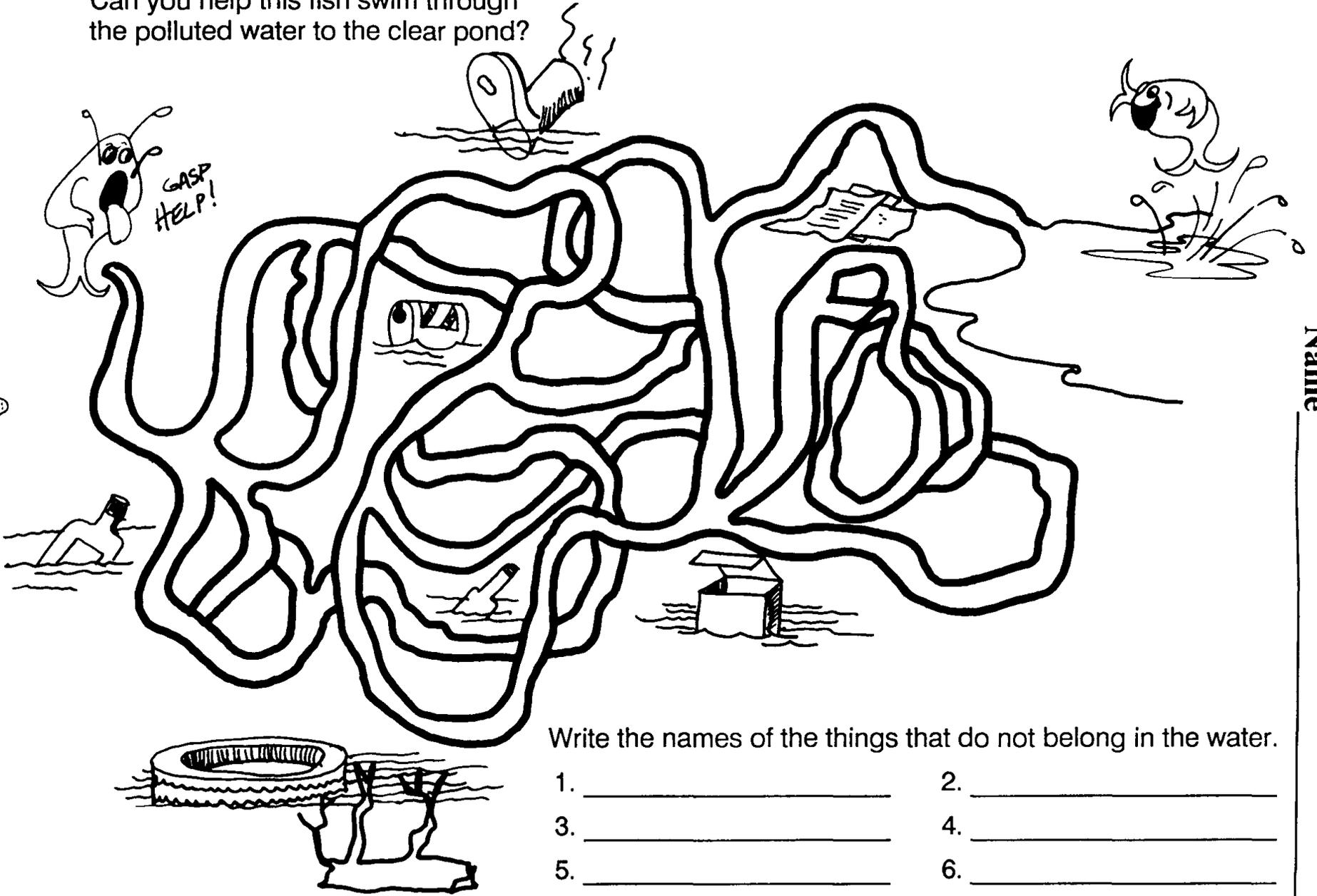
\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



Can you help this fish swim through the polluted water to the clear pond?

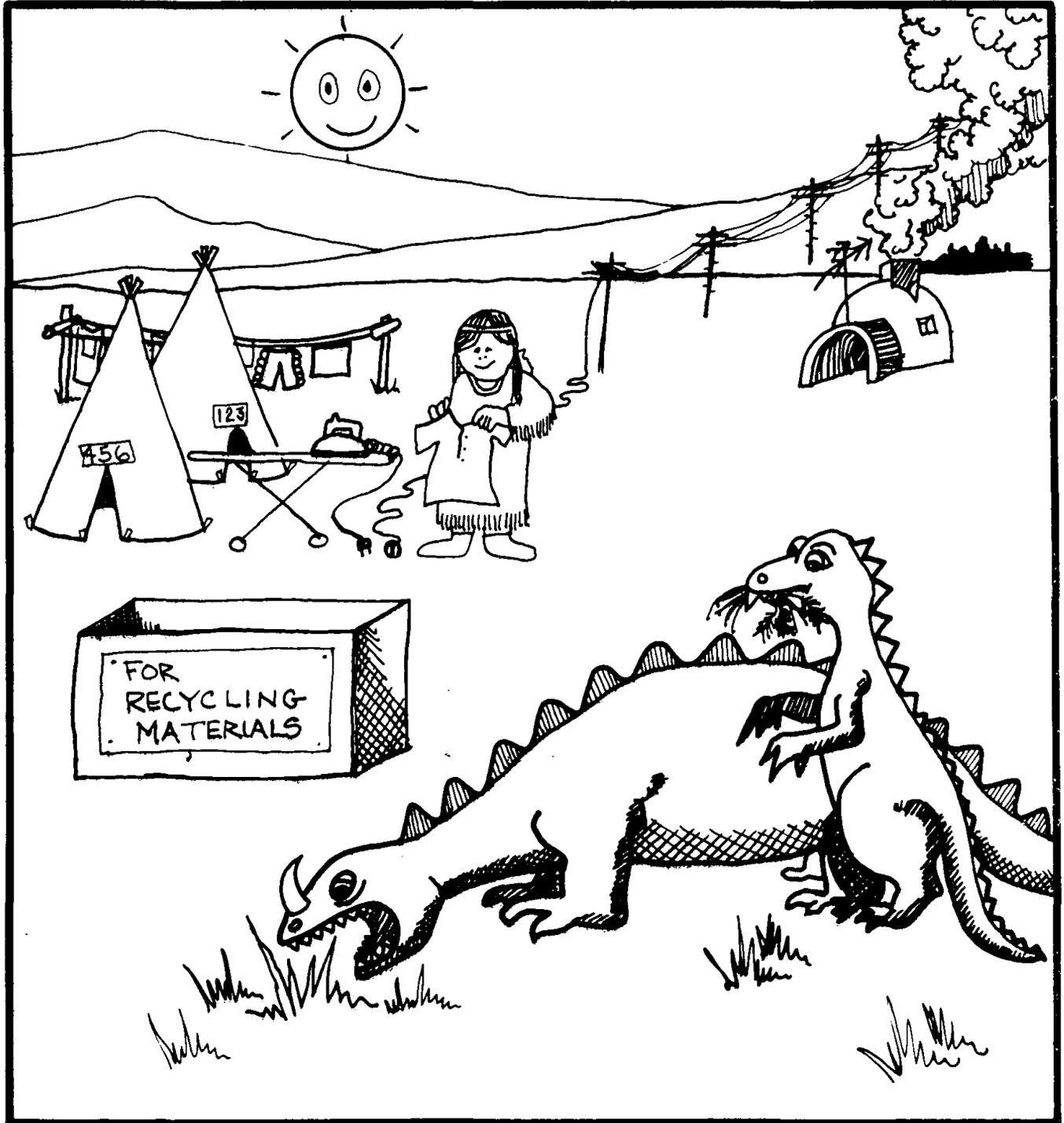


Write the names of the things that do not belong in the water.

- 1. \_\_\_\_\_
- 2. \_\_\_\_\_
- 3. \_\_\_\_\_
- 4. \_\_\_\_\_
- 5. \_\_\_\_\_
- 6. \_\_\_\_\_

Name \_\_\_\_\_

**Directions:** Here is a picture of an Indian village in early California. Make an X on all the things in the picture that are wrong. Do you know why?





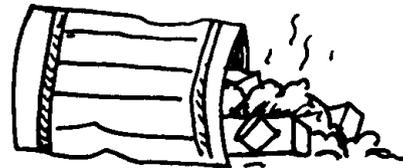
**Directions:** Read the story. Draw a line under the best answers to the questions.

Every now and then something happens that shows how people's carelessness can affect other animals in their environment. The animal in this true story is a Risso dolphin, normally found only in mid-ocean.

People at Marineland, a zoo for sea life just south of Los Angeles, began receiving calls reporting that a dolphin, that seemed to be hurt, was seen in San Pedro Harbor. It is against the law to collect dolphins near shore unless they are ill and attempt to beach themselves. The dolphin finally did so and was rescued by the Marineland crew. The dolphin had two main problems – he couldn't swim and he wouldn't eat. The trainers at Marineland patiently tried feeding him and swimming with him in a small tank at the zoo.

At first he began to get better and trainers had high hopes. But then, 10 days after he had been picked up on the beach, the dolphin died. He had not been able to eat. An examination was held, and inside the dolphin were found: 20 to 25 giant 30-gallon plastic trash bags, two plastic 6-pack beer holders, and about 25 feet of plastic twine. In all, there were eight pounds of plastic litter inside the dolphin.

1. A good title for this story would be:  
It's Fun to Go to the Seashore  
Litter Harms Animals  
Man Should Not Feed Plastic to Animals
2. The dolphin was first seen:  
swimming in San Pedro Harbor.  
at Marineland.  
in mid-ocean.
3. The Marineland crew tried to:  
train the dolphin to do tricks.  
remove the plastic litter.  
get the dolphin to eat and swim.
4. It is against the law to:  
feed dolphins.  
catch dolphins in the water near shore.  
help them when they are sick.
5. The dolphin died because:  
he swam too far from his home.  
he was old.  
he ate litter left by people.



**Directions:** Read the story. Draw a line through the sentences that do not belong in the story.

### Litter on the Beach

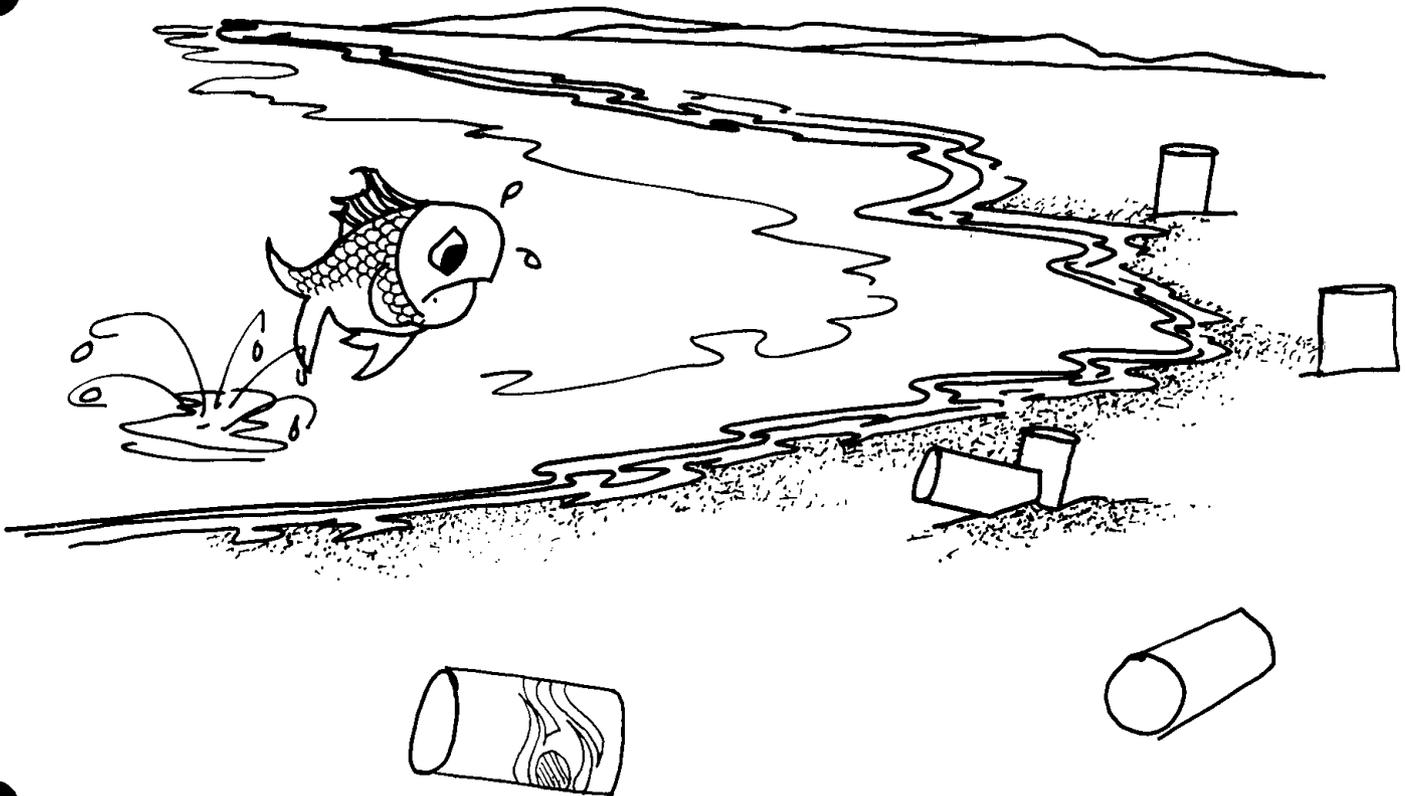
We see all kinds of litter on the beach. The can, bottles and papers that have been left by people are ugly to look at. We like to swim in July.

Some beach litter is made of metal. When it rains, the rivers and lakes fill up again. These metal things often have sharp edges which can harm people and wildlife.

Some metals are worse than others. Metals that rust contain iron. Car exhaust is a major source of air pollution. You can tell if the metal is iron because it will stick to a magnet. Iron comes from the earth. Trees provide us with wood to build houses. Iron will keep rusting until it is part of the earth again.

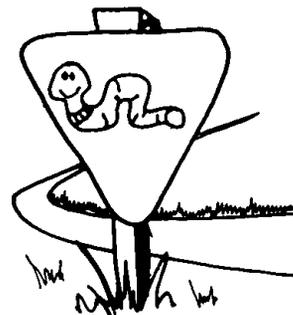
Sunday is the first day of the week. Some cans are made of aluminum. Aluminum will not rust. A magnet will not stick to it. These cans will never break down and become part of the earth again.

Both kinds of metal litter are bad. We have trash cans in our classrooms at school. It takes a long time for cans made of iron to rust. But aluminum cans will litter our beaches forever unless they are picked up.



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## Activity 34 Wildlife Conservation Signs Can Save



**Subject Area:** Art, Language Arts, Health

- Objectives:**
1. The students will recognize symbols designed to help conserve our environment and to promote safety.
  2. The students will design a sign to help with the school environment.

**Suggested  
Grade Level:** 3-4

- Materials:**
1. Construction paper
  2. Crayons or paint
  3. Worksheet 1
  4. Activity Sheets 1 and 2

- Procedure:**
1. Display two signs (Activity Sheets 1 and 2). Have the students guess what the symbols mean. Discuss the diagonal slash to mean "NO".
  2. Lead a discussion on the importance of signs in the environment. Stress that signs serve as reminders to use land and natural resources wisely. The no bikes sign would be placed to conserve grass or an area. Deer crossing signs would be placed to alert drivers of possible deer on the highway. Have students tell why most universal signs don't have words.
  3. Have students complete Worksheet 1.
  4. Have students design a general conservation symbol or a symbol that relates to one aspect of conservation. (hunting area, no littering, etc.)

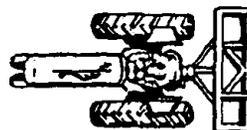


You cannot build a fire here

5. Construct protective signs for plants and areas around your school. Ideas: (trash goes here, restrooms, bikes should be parked here, no running in the halls). Display these in the school.

**Adapted  
From:**

1. Learning With Otis







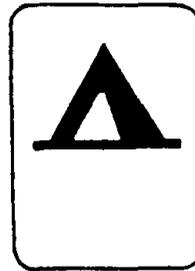
## Sign Up for Conservation

What do you think these signs mean? Write your answer below each sign.

no bikes  
campground

deer crossing  
handicap area

hiking trail  
picnic area



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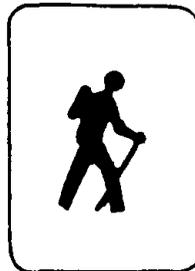
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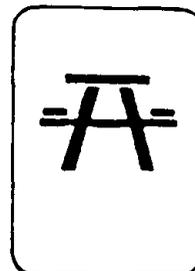
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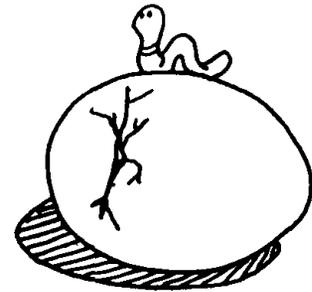
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# Activity 35 Wildlife Conservation Hatching Egg-citment



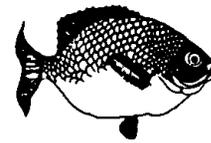
**Subject Area:** Math, Science

**Objective:** 1. The students will understand things in the environment that affect fish eggs hatching.

**Suggested Grade Level:** 3-4

**Materials:**

1. A game sheet for every 2-3 students
2. Coin
3. Game markers
4. Scratch paper

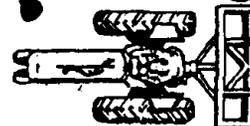
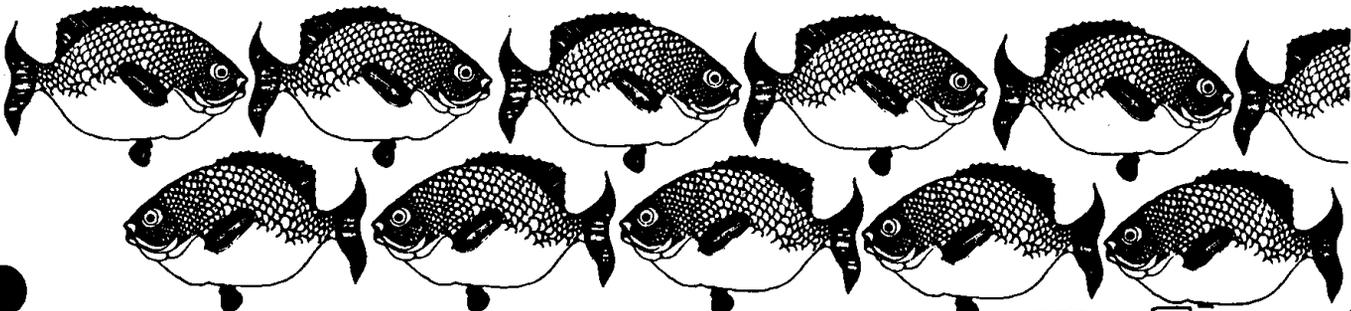


**Procedure:**

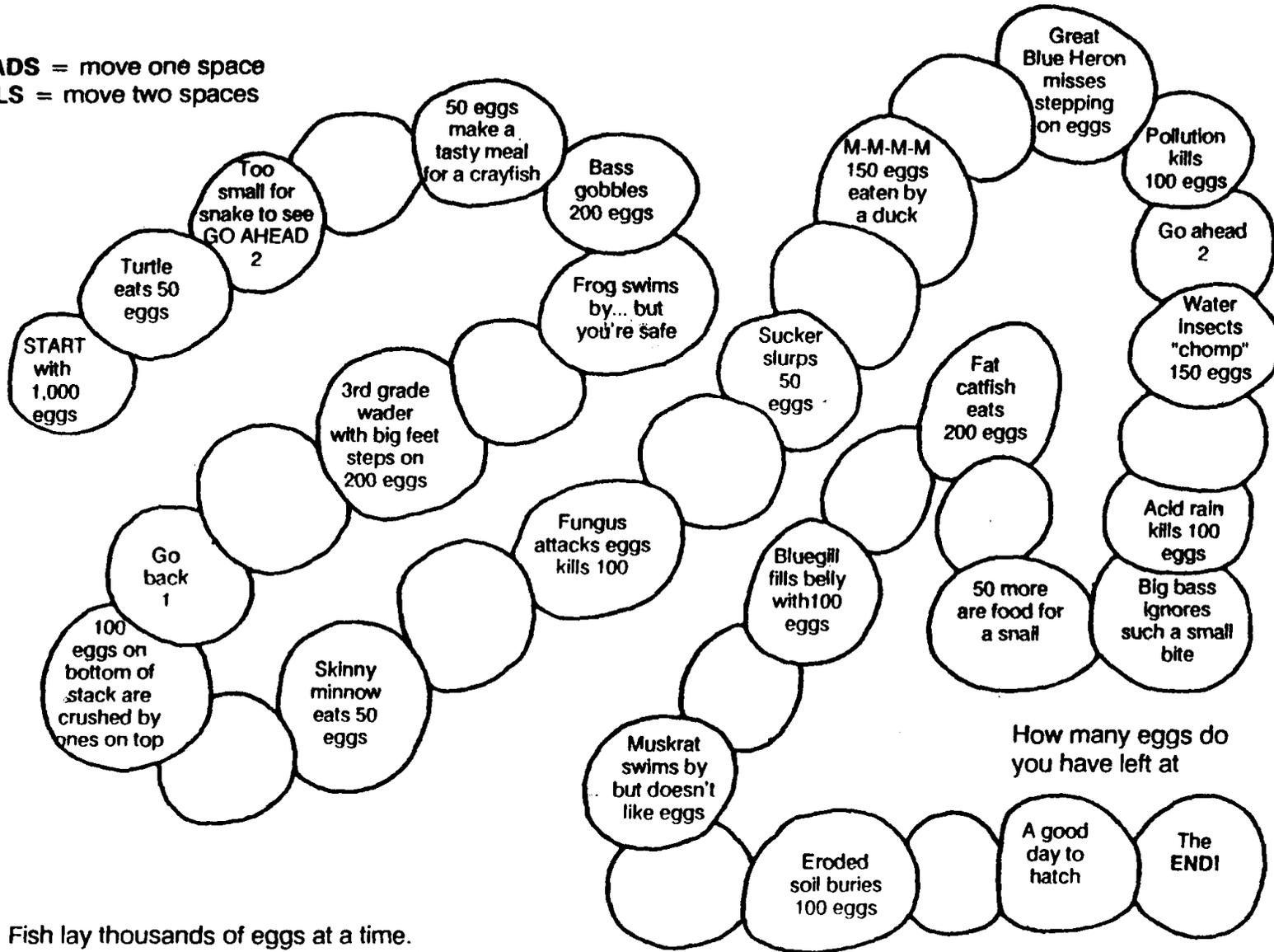
1. Read the paragraph at the bottom of the game page. What would happen if all the fish eggs hatched? (There would be too many fish for the available amount of food, cover, and space. Most would probably be eaten because there wouldn't be enough hiding places.)
2. Have students identify the things that limit fish eggs from hatching. Define "limiting factors" as things that keep down the number of animals.
3. Have students play the game individually or in small groups. Each student starts with 1,000 eggs. The student flips a coin to move one or two spaces. (See gameboard). The student keeps track of the number of eggs he has throughout the game on scratch paper. The one with the most eggs left at the end is winner. At the end of the game, ask students which of the hazards in the game are caused by people? (Erosion, acid rain, pollution, wading) What can you do to help protect the eggs?

**Adapted From:**

1. Soil Conservation Topics Educational Kit



**HEADS** = move one space  
**TAILS** = move two spaces



Fish lay thousands of eggs at a time.  
 Many eggs will be eaten by bigger fish and other animals.  
 Some eggs die from disease, or accidents or pollution  
 Some eggs will hatch into fish which will grow up and lay more eggs.

Name \_\_\_\_\_



# Answer Keys

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Where Did Our Pizza Come From?

Listed below are some of the ingredients of a pizza. You may want to add some of your favorites that are not on the list.

Look up:

1. The main resource material of the ingredient.
2. A possible geographic location of the resource material.
3. What processing step(s) are needed to make the ingredient.
4. A possible geographic location of the processing.



Then fill in this chart. The first item has been done as an example.

Ingredient	Resource Material	Location	Processing	Location
Flour	Wheat	Nebraska	Cleaning Milling	Omaha
Salt				
Spices				
Tomato				
Sauce				
Sausage				
Hamburger				
Cheese				
Your Favorites:	_____			
	_____			

The ingredients came from many different locations and were processed in many other locations. What basic natural resources are common to the pizza ingredients?

SOIL AND WATER

Directions: Fill in the missing numbers

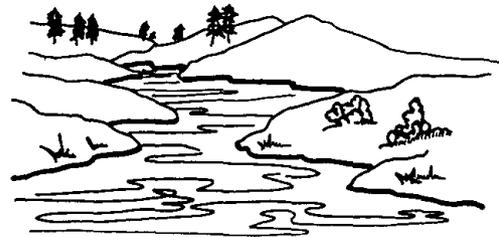
1	2	3	4 N	5	6	7	8	9	10
11 A	12	13	14	15	16 S	17	18	19	20
21	22 R	23	24	25	26	27	28	29	30 D
31	32	33	34	35	36	37 O	38	39	40
41 W	42	43	44	45 I	46	47	48	49 T	50 E
51	52	53	54	55	56	57	58 L	59	60

Answer the question below by filling in the spaces. Use the letters in the boxes that match the numbers under each space.

What are three of our natural resources?

S O I L     A I R     A N D  
 16 37 45 58     11 45 22     11 4 30

W A T E R  
 41 11 49 50 22



Directions: Circle the correct number that completes the math problem. Write the letter that is under the correct number on the blank spaces.

$4 + 5 = 9$       $3 + 9 = 12$       $2 + 7 = 9$       $1 + 9 = 10$   
 8 9 7     9 4 8     4 1 2     8 2 8  
 P (S) T     (A) B O     W M (N)     L R (D)

Glass is made from S A N D.

$6 + 5 = 11$       $2 + 8 = 10$       $3 + 6 = 9$   
 3 5 4     8 7 9     2 4 3  
 B (O) T     (I) A R     T O (L)

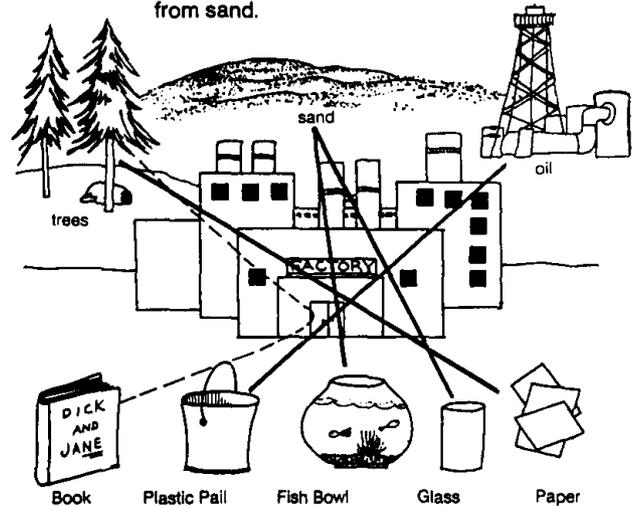
Plastic is made from O I L.

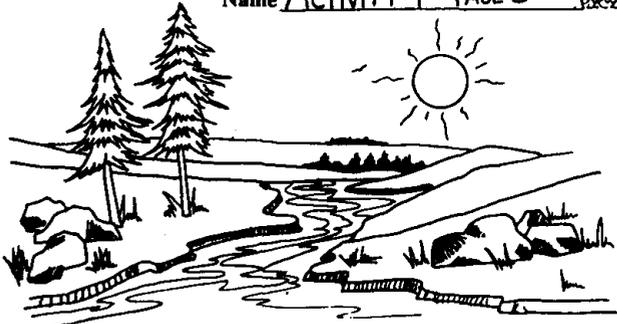
$8 + 7 = 15$       $6 + 4 = 10$       $7 + 2 = 9$       $3 + 3 = 6$   
 9 2 7     3 6 1     7 4 6     2 5 6  
 P X (W)     G (O) L     (O) R J     A S (D)

Paper is made from W O O D.

We get many things from our natural resources. Some of these things are made in factories.

Directions: Draw a line from the things we use back to the natural resource that it comes from. Be sure to go through the factory. Use a black crayon if the object is made from oil. Use a green crayon if the object is made from wood. Use an orange crayon if the object is made from sand.





**Natural Resources**

Natural resources are things we get from nature. Water is a natural resource. The sun is another natural resource. Trees and minerals are natural resources, too.

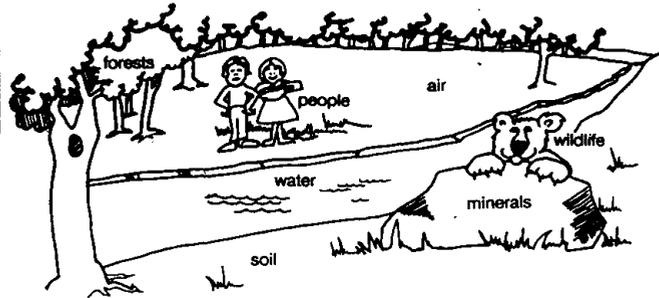
We use our natural resources to make the many things we use everyday. They also can provide us with energy and power.

Write "yes" or "no" after each question.

1. Is a river a natural resource? YES
2. Is sunlight a natural resource? YES
3. Is a plastic cup a natural resource? NO
4. Is wood a natural resource? YES
5. Is a book a natural resource? NO
6. Is gold a natural resource? YES

Worksheet 5

Here are seven of our natural resources. Write the name of the correct natural resource in the blank space in each sentence below.

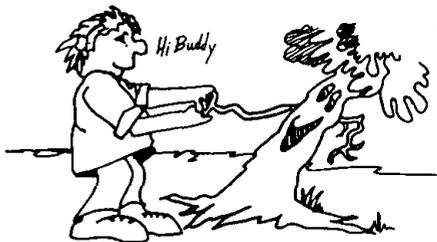


1. We need WATER to drink, to bathe in and to wash clothes in.
2. Plants, animals and people need AIR to breathe.
3. We need SOIL to grow plants in.
4. Salt, chalk and silver are some of the MINERALS we use.
5. PEOPLE need to use natural resources wisely and to save or conserve them for the future.
6. We use our FORESTS for wood to build houses and furniture.
7. Rabbits, bears and deer are part of our WILDLIFE.

Worksheet 6

Directions: A word in each sentence is all mixed up. Unscramble the letters and write the word correctly on the blank space.

1. Most paper is made from doow. WOOD
2. The pages of your book were once a eret. TREE
3. Nasd is used to make glass. SAND
4. Plastic is made from lol. OIL
5. Minerals give us many matlies. METALS
6. We need to vesa our natural resources. SAVE
7. We should be careful not to teaws them. WASTE



Worksheet 7

**Renewable Resources**

Years ago there were not as many people as there are today. People did not worry about running out of things. If some trees were cut down for wood or fuel, others began to grow. If some animals were killed for food, others were born. Things that were used were replaced by new living things. For this reason plants and animals are called 'renewable resources.'

Air is also a renewable resource. Plants and animals recycle the air. The plants give off oxygen which is the part of the air that animals need to breathe. Animals, in turn, give off carbon dioxide that plants need.

Another renewable resource is soil. But it takes a long, long time for decaying plants and animals to become soil. We need to take care of the soil.

Nonrenewable resources are things which cannot be replaced. Once they are used they are gone forever. There is a limited amount of these materials on the earth.

Ores, from which metals are made, and minerals that come from the rocks and earth are nonrenewable resources. Fossil fuels, coal, oil and natural gas are also nonrenewable resources. When we use up what there is, there will be no more.



Directions: On the space in front of each item below, put a '1' if it is made from a renewable resource, if the item is made from a nonrenewable resource put a '2'.

- |                                   |                          |                        |
|-----------------------------------|--------------------------|------------------------|
| <u>2</u> roller skates            | <u>1</u> paper           | <u>2</u> zippers       |
| <u>1</u> lumber                   | <u>2</u> television sets | <u>2</u> fishing reets |
| <u>2</u> knives, forks and spoons | <u>1</u> wool shirts     | <u>1</u> cardboard     |
| <u>2</u> cars                     | <u>2</u> plastic pots    | <u>2</u> stoves        |
| <u>2</u> movie film               | <u>2</u> alarm clocks    | <u>2</u> glasses       |
| <u>1</u> breakfast cereals        | <u>2</u> tribes          | <u>2</u> bicycles      |

Worksheet 8

Here are some ways you can help to save our natural resources

Directions: Write yes in front of the ways that will help.  
Write no in front of the ways that will not help.

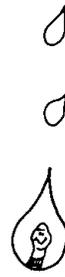


**Ways to Save Our Natural Resources**

- YES Use both sides of writing papers.
- NO Always use paper cups and plates.
- YES Turn off lights you are not using.
- NO Throw books away after you have read them.
- YES Turn off water you are not using.
- YES Recycle as many things as you can.

**Plants Drink Water Too!**

Directions: Put a "T" if the sentence tells something true about our experiment.  
Put an "F" if the sentence tells something that is not true about the experiment.



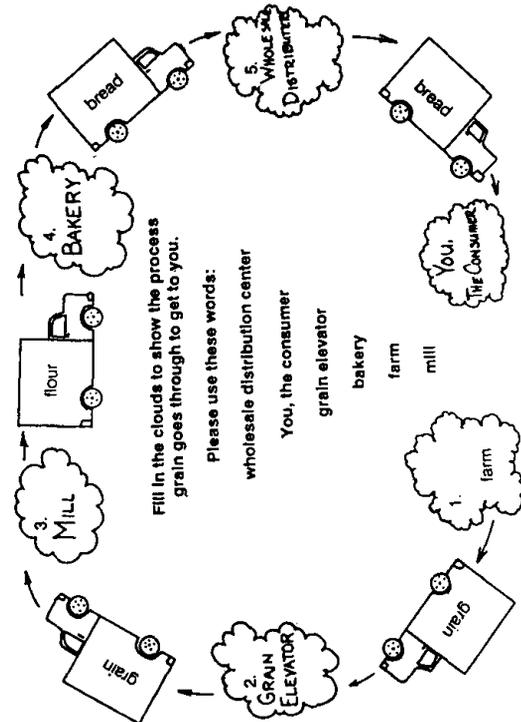
- T We cut the end off the celery.
- F The celery did not drink water.
- T Our celery stalk had leaves on it.
- F We added color to the water to make it pretty.
- T We added color to the water so we could see how it travels up into the plant.
- T The veins in the celery that carry the water up into the plant are called xylem.
- F The dye moved up to the top of the celery in 5 minutes.
- F Plants could live without any water.



Put these water words in alphabetical order.

- |        |               |
|--------|---------------|
| xylem  | <u>CELERY</u> |
| celery | <u>DRINK</u>  |
| phloem | <u>PHLOEM</u> |
| water  | <u>PLANT</u>  |
| drink  | <u>WATER</u>  |
| plant  | <u>XYLEM</u>  |

<p>Place two wet paper towels on the bottom of a shallow dish. A pie plate is good.</p>	<p>Put ten seeds on the towels and cover with two more wet paper towels.</p>	<p>Place the dish in a warm place; near the furnace, heat register or in a sunny spot.</p>
<p>Sprinkle the towels with water everyday. Keep towels moist. DO NOT LET THE SEEDS STAND IN A LOT OF WATER, AS THIS WILL CAUSE THEM TO ROT.</p>	<p>When the root is about one-half inch long, you may plant the germinated seed in a small pot with dark rich dirt. Put the seed about one inch under the top of the dirt.</p>	<p>Plant it outdoors if it is spring and harvest.</p>
<p>Water the pot when the soil dries out.</p>	<p>Soon the seed will sprout and then as it grows larger it will grow leaves</p>	



**More or Less**

Finish the following sentences with your own ideas.

 1. I can save water when I brush my teeth by NOT LETTING THE WATER RUN CONSTANTLY

 2. I can save water when I get a drink of water by KEEPING A JAR OF COLD WATER IN THE REFRIGERATOR SO I DON'T HAVE TO LET THE WATER RUN

 3. I can save water when I wash dishes by MAKING SURE I HAVE FULL LOADS IN THE DISHWASHER

**Can You Solve This?**

A family of four persons uses about 280 gallons of water a day. Suppose that this family could save 12 gallons of water each day. If everyone in the United States did the same, how much water could be saved each day?

(Assume that there are 250,000,000 people in the United States, and be sure to read the question carefully, it could trick you!)

12 GALLONS OF WATER DIVIDED BY 4 PEOPLE IN A FAMILY EQUALS THREE GALLONS SAVED PER PERSON PER DAY. THREE GALLONS TIMES THE U.S. POPULATION OF 250 MILLION EQUALS 750 MILLION GALLONS SAVED PER DAY.



Worksheet 2

**Directions:** Put a period ( . ) or question mark ( ? ) at the end of each sentence.

1. The most important liquid is water.
2. We use water for drinking and for raising food.
3. What do firemen use water for?
4. In June, we swim in pools, lakes and oceans.
5. When will Ann water her plant?
6. I turn off the water when I'm finished brushing my teeth.
7. Why did Jack and Jill go up the hill?
8. Who is Captain Hydro?
9. The Pacific and Atlantic Oceans are large bodies of water.
10. It usually rains in December, January and February.
11. Water is our most important natural resource.
12. How long can humans live without water?
13. Water flowing downhill turns waterwheels.
14. How can I make Kool-Aid without water?
15. All Plants and animals need water to live.



Worksheet 3

Water is one of our most important natural resources. We could not live without it. We borrow it from the natural water cycle, use it, and then return it to the cycle. Water is not used up, but recycled. We must clean the used water before returning it to the water cycle. If it is not cleaned, then we have polluted water. The more we use, the more we have to clean. It takes a lot of water to make the things we use.

**Directions:** In the problems below, change the quart measurements to gallons by dividing. Remember that it takes 4 quarts to make 1 gallon.

1. It takes 600 quarts of water to make the paper for one Sunday newspaper. How many gallons is that?

150 GALLONS

2. It takes 2600 quarts of water to make the steel for one bicycle. How many gallons is that?

650 GALLONS

3. It takes 300 quarts of water to grow just one ear of corn. How many gallons are needed?

75 GALLONS

4. It takes 800 quarts of water to make the rubber for one car tire. How many gallons is that? 200 GALLONS



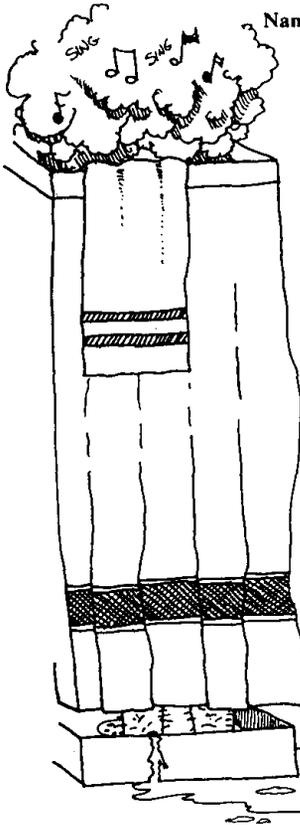
Worksheet 4



**Directions:** Find the contraction in each sentence and draw a line under it. Write the contraction and its meaning on the blanks.

1. I'm going to save water.  
I'M                      I                      AM
2. When I brush my teeth, I won't leave the water running.  
WON'T                      WILL                      NOT
3. I'll ask my Mom or Dad to fix the leaky faucets.  
I'LL                      I                      WILL
4. We'll all take short showers instead of baths.  
WE'LL                      WE                      WILL
5. Putting things down the toilet isn't a good idea.  
ISN'T                      IS                      NOT
6. Everyone knows we shouldn't waste water.  
SHOULDN'T                      SHOULD                      NOT
7. I don't think it will be very hard to do.  
DON'T                      DO                      NOT

Worksheet 5



Name ACTIVITY 13 PAGE 59 *Pete*

You use about 8 gallons of water every minute you are in the shower. If you use 8 gallons for a 1 minute shower, find out how many gallons you will need for the following showers.

- How many gallons would you use for a 2 minute shower?  
2 minutes x 8 gallons = 16 gallons
- How many gallons would you use for a 3 minute shower?  
3 minutes x 8 gallons = 24 gallons
- How many gallons would you use for a 4 minute shower?  
4 minutes x 8 gallons = 32 gallons
- How many gallons would you use for a 9 minute shower?  
9 minutes x 8 gallons = 72 gallons

If a tub bath uses about 35 gallons of water, how many gallons of water would you save by taking a 3 minute shower.

$$\begin{array}{r} 35 \text{ GALLONS} \\ - 24 \text{ GALLONS} \\ \hline 11 \text{ GALLONS} \end{array}$$

Worksheet 6

Name ACTIVITY 13 PAGE 60 *Pete*

Directions: Write the number that is missing in each pattern.

- 10 12 14 16 18 This is the last letter.
- 1 2 3 4 5 This is the second letter.
- 5 10 15 20 25 This is the third letter.
- 8 12 16 20 24
- 10 20 30 40 50
- 3 5 7 9 11 This is the fourth letter.
- 3 6 9 12 15
- 13 23 33 43 53 This is the first letter.

Use this code to find the letters to answer the question.

A	B	C	D	E	F	G	H	I	J	K	L	M
1	2	3	4	5	6	7	8	9	10	11	12	13
N	O	P	Q	R	S	T	U	V	W	X	Y	Z
14	15	16	17	18	19	20	21	22	23	24	25	26

What is our most important resource? W A T E R

Worksheet 7

Name ACTIVITY 13 PAGE 61 *Pete*

### Hydro Power

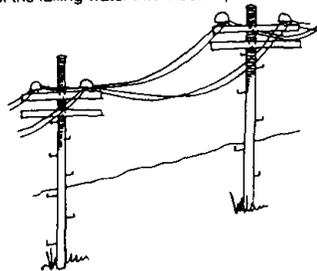
Moving water can light our houses, cook our food and help us to do many other things. The moving water can be used to make electricity. This is called hydro power.

First, a wall is built across a river. It is called a dam. Water builds up behind the dam. Some of the water is allowed to flow over or through the dam.



This moving water turns water wheels that run special machines called turbines or generators. These machines change the energy of the falling water into electric power.

The electric power comes to our homes over wires. We use the electricity to cook our food, keep us warm and give us light.



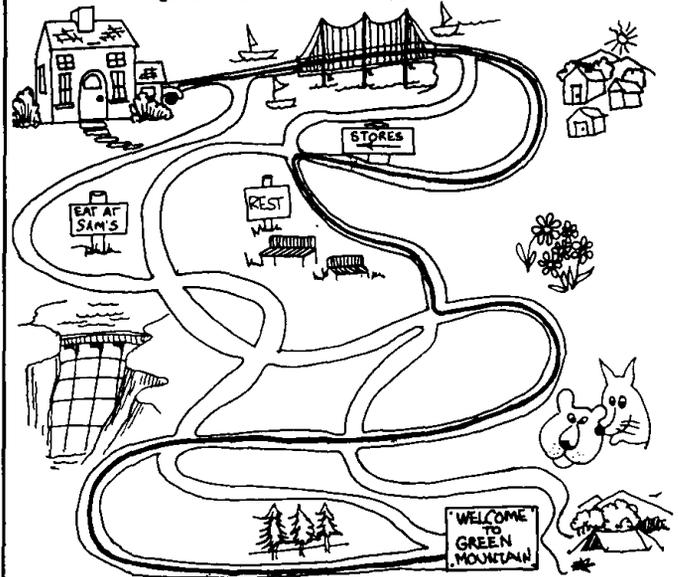
Directions: Write the names of things in your home that use electricity for power.

LIGHTS    MICROWAVE    TELEVISION  
STOVE    VACUUM CLEANER    STEREO

Worksheet 8

Name ACTIVITY 13 PAGE 63 *Pete*

Directions: Use the story to trace the roads that Betty and Joe took to get to the Green Mountain campground.



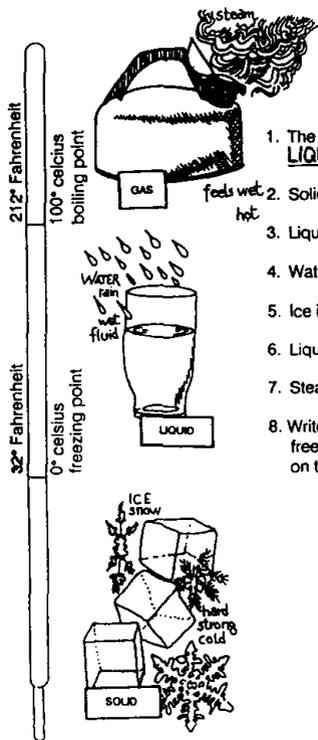
Write the names of three things Joe and Betty passed on the way that were made by people

HOUSES    REST STOP    SAILBOATS

Did these things change the environment?

Worksheet 10

**Water Has Three Forms**



- The three forms of water are GAS, LIQUID and SOLID.
- Solid water is called ICE.
- Liquid water is called WATER.
- Water as STEAM is called gas.
- Ice is strong, HARD and COLD.
- Liquid water is WET and FLUID.
- Steam is hot and WET.
- Write in the correct degrees for the freezing and boiling points of water on the thermometer.

Worksheet 1

**Working with Water**

Directions: Match the vocabulary words with their correct definition by writing the letter in the blank.

- |                       |   |
|-----------------------|---|
| 1. Stream <u>E</u>    | A. A large natural stream of water emptying into an ocean, lake or other body of water. |
| 2. Lake <u>C</u>      | B. A hole dug in the ground to reach water.   |
| 3. River <u>A</u>     | C. A relatively large inland body of water.   |
| 4. Ocean <u>H</u>     | D. All living things and their environment in an area of any size.                      |
| 5. Reservoir <u>F</u> | E. A body of running water with a steady current.                                       |
| 6. Well <u>B</u>      | F. A place above ground where water is stored.  |
| 7. Aquifer <u>G</u>   | G. A source of fresh water found below the surface of the earth.                        |
| 8. Ecosystem <u>D</u> | H. The large body of salt water that covers about 72% of the earth's surface.           |

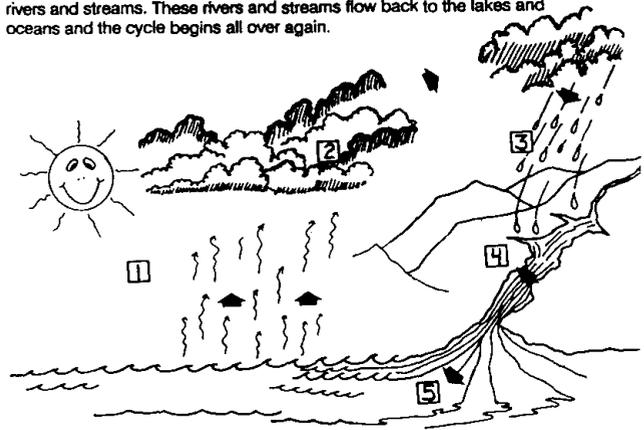


Worksheet 1

**The Water Cycle**

A cycle is a circle of events that happen over and over again in the same order. Here is how nature's water cycle works.

Solar energy (heat from the sun) evaporates the waters from oceans and lakes. This water becomes water vapor as it rises in the air. The water vapor gathers together to become clouds. As the clouds get bigger and heavier, they cool and turn into rain. When it rains, the water runs into rivers and streams. These rivers and streams flow back to the lakes and oceans and the cycle begins all over again.



Put these numbers on the part of the picture that shows what is happening.

- The sun's energy evaporates the water.
- The water vapor gathers into clouds.
- The clouds cool and rain begins.
- Rain runs into rivers and streams.
- The rivers and streams flow back to the ocean and lakes.

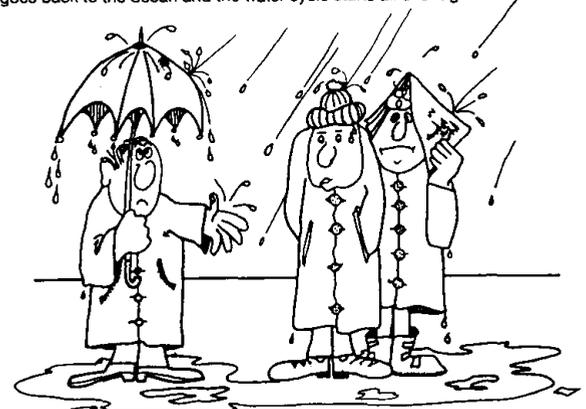
Worksheet 1

Directions: Use these words to fill in the blanks in the story.

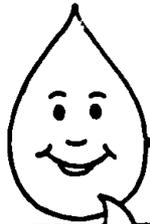
- clouds    drink    oceans    sun  
rain    rivers    sewers

**The Water Cycle**

Most of the water on the earth is in the OCEANS. The water is salty there. Every day, the SUN shines on the water and heats it up. Some water evaporates and becomes CLOUDS. These move over the land and fall as RAIN and snow. The water runs over the land and into RIVERS. People can use this fresh water to DRINK, wash and grow plants. After the people use the water, some of it goes into SEWERS. Then the water goes back to the ocean and the water cycle starts all over again.



Worksheet 2



The problem is this. After I'm used I have to go back to the natural water cycle where nature has its own ways of cleaning me.

But I'm getting so dirty today that nature needs a lot of help!

It can get that help from a sewage treatment plant where I'm often sent before I get back into the natural water cycle.

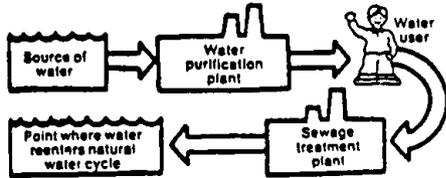
Even that's not as easy as it sounds. If too much of me has to be cleaned the plant may not bother with me... or may not do a very good job.

I said I need your help. You can give it by:

1. Not using more of me than you need. Then I won't have to be cleaned so often.
2. Keeping me clean in every way you can.

### Where does your water come from... Where does it go?

Study the diagram below. Then see if you can answer the questions that follow it.



Do you know the source of the water you use at home?  
 Is your water purified before you use it? After you use it?  
 Do you know where this purification takes place?  
 Do you know where the water you use reenters the natural water cycle?

ANSWERS VARY DEPENDING ON THE AREA.

Directions: Use the Table of Contents to answer the questions.

Contents	
Introduction	
1. The Water Cycle	3
2. Every Living Thing Needs Water	6
3. Water for Electricity - Hydro Power	9
4. Water Pollution	14
5. Conserving Water at Home	22

1. To find out that we cannot live without water, you should look on page 6.
2. The chapter about the water cycle begins on page 3.
3. Ways of saving water begin on page 22.
4. The problems of dirty water start on page 14.
5. How we use water to light our homes will begin on page 9.
6. Fixing faucets that drip and taking short showers will begin on page 22.

Directions: Read each story. Choose the best title and draw a line under it.

Water is our most important natural resource. All plants and animals need water to live. Man could not live more than 4 or 5 days without water.

Our Natural Resources  
Plants and Animals are Alike  
Water is Important

Most of our water today is used for growing plants and animals for food. In our homes we use water to drink, cook our food and to bathe. We also use water for fun when we swim, go fishing or boating.

Uses of Water  
Swimming is Fun  
Cool, Clear Water

We use the same water over and over. The sun evaporates the water from the lakes and oceans. The Water vapor forms clouds. When the clouds get heavy, it rains. The rain runs into rivers and streams and back to the oceans. Then the water cycle begins again.

How Clouds are Made  
The Water Cycle  
 Rainy Weather

Everyone should be careful not to waste water. We should remember not to let the water run needlessly. Don't pollute the water by putting things down the drain that can cause harm to others. We need to keep our water clean and use it wisely.

Living Without Water  
Taking Care of Our Water  
Our Polluted Rivers

Directions: Use the words in the box to fill in the blanks in the story. Read the story again to answer the questions at the bottom of the page.

conservation	deep	threatened
solve	sediment	trout
state	prevent	recreation

### Long Pine Creek

The Long Pine Creek is the longest self-supporting trout stream in the STATE of Nebraska. The trout are being THREATENED of losing their home in Lone Pine Creek. Farmers have not been using CONSERVATION practices to protect the soil and keep it on the land. The soil had been eroding into the creek causing increased SEDIMENT to settle on the bottom of the creek. Now Long Pine Creek is not as DEEP as it once was. This change has affected the future of TROUT in Long Pine Creek as well as RECREATION for people. People are working to SOLVE this problem. Can we PREVENT this from happening in other places?

Answer the following questions:

Who could lose their home in Long Pine Creek? TROUT

How can farmers keep the soil on the land? THEY CAN KEEP SOIL BY USING CONSERVATION PRACTICES

What is settling at the bottom of Long Pine Creek? SEDIMENT

Can we prevent this from happening in other places? YES  
 How? ANSWERS WILL VARY

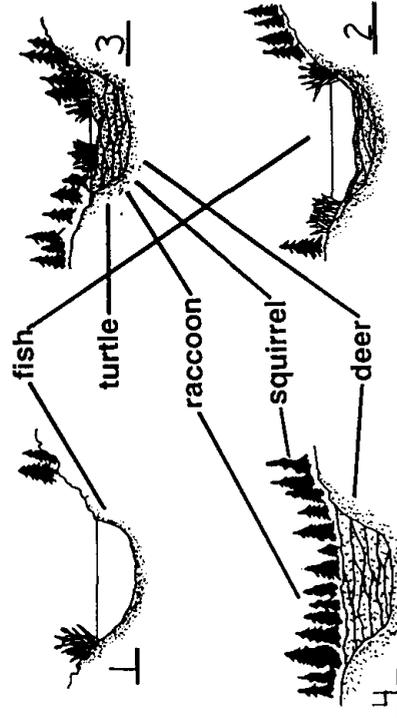
Word Bank			
sewers	poisons	chlorine	smog
pollute	carbon monoxide	sewage	filters
sewage treatment plants	hot	trash	water

Use words from the Word Bank to complete each sentence below.

- Your environment is made up of soil, air and WATER.
- A dangerous pollutant in the exhaust of cars is the gas CARBON MONOXIDE.
- When sewage and waste flow into streams, they POLLUTE the streams.
- In many cities, liquid wastes run into underground pipes called SEWERS.
- Pesticides pollute the water because they are POISONS.
- Many cities build SEWAGE TREATMENT PLANTS to clean their water.
- A chemical that kills germs is called CHLORINE.
- Special FILTERS placed inside smokestacks can help keep the air clean.

Study Guide 3

Directions: On each line, number the drawings to show their order from first to last. Then, draw lines from each animal name to the places where they would be most likely to live.



Worksheet 1



Trees are one of Nebraska's natural resources. Among the tallest trees in the world are the redwoods growing in Northern California and Southern Oregon. Nebraska has 781,282 acres of commercial forest land. Trees are important because they provide a renewable source of energy. By planning wisely we can grow new trees to replace the trees we use.

Directions: Use the code and your answers to the problems to solve the riddle.

How can an elephant get to the top of a tree?

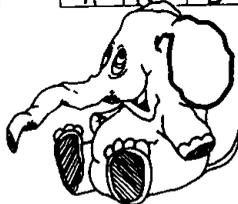
Code Box

A	B	C	D	E	F	G	H	I	J	K	L	M
1	2	3	4	5	6	7	8	9	10	11	12	13
N	O	P	Q	R	S	T	U	V	W	X	Y	Z
14	15	16	17	18	19	20	21	22	23	24	25	26

38	45	53	96	73	90	29
19	36	33	81	59	82	15
S	I	T	O	N	A	N

79	70	42	44	65	60	32	51
78	67	27	26	51	58	18	47
A	C	O	R	N	A	N	D

82	80	60	72
58	78	51	52
23	T	9	20
W	A	I	T



Worksheet 1

Read the Story

Once upon a time, there was plenty of room on Earth for all the plants, animals and people. They all shared their environments very nicely.



As years went by, there were more and more people. More people needed more homes. To build them, more trees were cut down. Wild animals also used the trees for homes. They had to move.



More people needed more food. To grow more food, more land was needed. The wild animals had less and less room and food. Soon there were fewer wild animals.



Answer the Questions

- People cut down trees to build HOMES.
- They needed more land to grow MORE FOOD.
- The wild animals had less and less ROOM and FOOD.
- There were fewer wild ANIMALS.

Worksheet 1

Gifts From Trees

Food Fruit - Nuts	Construction Buildings - Furnishings	Paper Products Kinds of - Products	Animal Needs Homes - Food	Other
APPLE LEMON CHERRY ORANGE PLUM PEACH PEAR	HOUSE SCHOOL SHED GARAGE BANK CHURCH STORE	DESK CHAIR DRESSER TABLE SHELF CUPBOARD CABINET GRAPH BED	NEST BRANCH HOLE LEAVES BARK BUDS ROOTS	KITES PATTERNS CLOTHES LUMBER SYRUP
WALNUTS PECANS	HOUSE SCHOOL SHED GARAGE BANK CHURCH STORE	NEWSPAPER DRAWING WRAPPING TISSUE CARDBOARD NOTEBOOK CONSTRUCTION	MILK EGGS SOAP FOODS BARK BUDS ROOTS	

Worksheet 2

Directions: Arrange each group of numbers in order (smallest to largest) to read the message.

52 87 60 2 16 99 8 37 63 21 11 29 79 46 58 81  
E I A T E L R A N S E W D T R O

Write the numbers on the line. Write the letter that goes with it underneath.

2 8 11 16 21 29 37 46 52 58 60 63 79 81 87 99  
T R E E S W A T E R A N D O I L

162 196 170 100 119 193 180 179 182 105 155 112 143 167 126 139 138 150 181  
R S S A N E U O C R L R E R E A U T A R

100 105 112 119 126 138 139 143 150 155 162 167 170 179 180 181 182 193 196  
A R E N A T U R A L R E S O U R C E S

521 413 311 864 200 374 287 723 226 598 600 899 241 789 790  
N N D K F I N R O E B A U A S

200 226 241 297 311 374 413 521 598 600 723 789 790 864 899  
F O U N D I N N E B R A S K A



Worksheet 3

Tree - Mendous Math

1. Together Sue, Randy and Chris planted a total of 27 Pin Oak trees. If every student planted the same amount of Pin Oaks, how many trees did each student plant?

$$3 \overline{) 27} \quad \underline{9 \text{ PIN OAKS EACH}}$$

2. Tom, who farms near Grand Island, planted a windbreak on the north side of his farm. He planted 137 Red Cedars and 286 Rocky Mountain Junipers. How many trees did he plant in all?

$$\begin{array}{r} 137 \\ +286 \\ \hline 423 \end{array} \quad \underline{423 \text{ TREES}}$$

3. Use the information from this chart to answer the questions.

Tree	Life Span in Eastern Nebraska
Scotch Pine	80 years
Ponderosa Pine	200 years
Colorado Blue Spruce	120 years

Use mental math to figure out the difference in life spans between these trees:

Colorado Blue Spruce and the Scotch Pine 40 years  
Ponderosa Pine and the Scotch Pine 120 years  
Ponderosa Pine and the Colorado Blue Spruce 80 years

Worksheet 1

4. This is a list of some Nebraska counties and their acres of commercial forest area.

County	Acres
Buffalo	9,288
Cherry	32,840
Cass	18,200
Dawes	62,180
Douglas	6,600
Hall	5,701
Lancaster	4,800
Lincoln	7,518
Madison	3,920
Sheridan	50,150



Answer these questions from the table above.

- A. Which county has the least amount of commercial forest area?  
MADISON
- B. Which county has the most commercial forest area? DAWES
- C. What is the difference between the commercial forest acres of Douglas and Cherry counties? 26,240 ACRES
- D. Three times the size of the acres in Hall county would almost be as big as the forest acres of CASS county.
- E. What is the total of the commercial forest acres of Buffalo, Lancaster and Lincoln counties? 21,606 ACRES
- F. Which county has the most acres, Sheridan or Dawes? DAWES

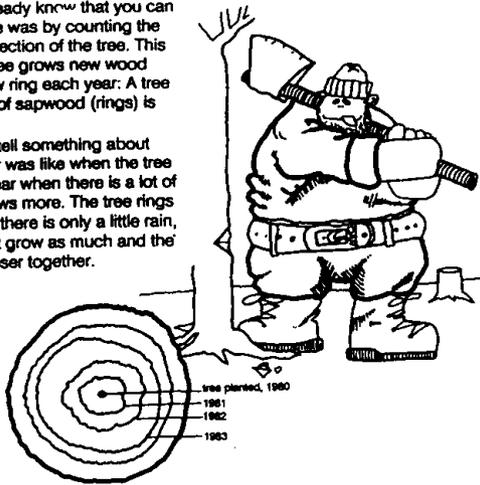


Worksheet 1 (con't)

**Tree Rings**

Tree rings can tell us many things. You probably already know that you can tell how old a tree was by counting the rings in a cross section of the tree. This is because the tree grows new wood and makes a new ring each year. A tree with nine circles of sapwood (rings) is nine years old.

You can also tell something about what the weather was like when the tree was alive. In a year when there is a lot of rain, the tree grows more. The tree rings are wider. When there is only a little rain, the tree does not grow as much and the tree rings are closer together.



Directions: Use the cross section above to answer the questions.

1. During what year was this tree cut down? 1985
2. How old was the tree when it was cut? 5 YEARS
3. Between what years was there a lot of rain? 1982 and 1983
4. Between what years was there just a little rain? 1983 and 1984

Some giant sequoias have more than 3,500 rings. Were these trees living before America was discovered? Yes

Directions: Correct the story by drawing a circle around the right homonym.

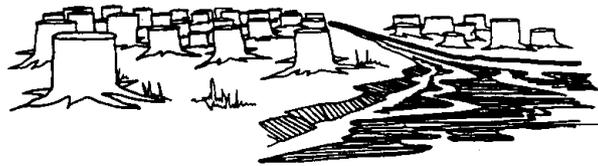
**Our Forest**

When the first settlers came to America, forests covered (too two) thirds of the land. The settlers cut down the trees to make room for (their they're) farms. They used the (would, wood) to build houses and to burn for fuel.

Soon loggers and farmers were cutting down (hole whole) forests. They often "clear cut" areas of land. This means they used big machines to knock down all the trees. When they were (threw through), the land was (bare bear).

(Some Sum) people said, "We (no know) there will always be more trees." But, they were wrong. Other people began to worry about (our hour) forests. They (new knew) that clear cutting of forests could cause floods and destroy the homes of animals. They helped to get laws passed to protect our forests.

Conserving a forest does (knot, not) mean leaving the trees alone, for the forest is a living, renewable resource. It means protecting the forest and using it wisely.



Directions: Synonyms are words that have the same, or almost the same, meaning. Use the words below to complete the sentences. Choose the word that has almost the same meaning as the word in the parentheses ( ).

- |          |          |            |           |
|----------|----------|------------|-----------|
| enlarge  | damage   | endangered | protected |
| overflow | distress | stripping  | soil      |

1. The trees in Redwood National Park were in (trouble) DISTRESS.
2. Lumber companies were (clearcutting) STRIPPING trees from the lands next to the park.
3. When it rained, (dirt) SOIL ran off the treeless land and into the Park.
4. The rainwater caused Redwood Creek to (run over) OVERFLOW its banks.
5. The flood water began to (hurt) DAMAGE the roots of the biggest and oldest redwood trees in the Park.
6. Then Congress voted to (expand) ENLARGE the Park.
7. This kept the loggers farther away from the (threatened) ENDANGERED trees.
8. Hopefully, this will keep the beautiful old redwood trees (safe) PROTECTED.



**Forest Fires**

Fire can destroy large parts of our environment. Some forest fires are caused by nature, but most are caused by people. A forest fire kills animals and plants. When there is a forest fire, even the animals that can run away lose their homes and the places where they get their food.

Directions: Read the newspaper stories. Draw a line under the sentence that tells how the fire started. Write people or nature on the spaces to show who caused the fire.



**Fire Burns 500 Acres**

Forest rangers believe that the fire was started by a campfire that was left burning. Five hundred acres were destroyed by the fire.

PEOPLE

**Fire In National Forest**

Lightning struck a large tree in the Green Pines forest. The tree burst into flames. The fire was first seen by Rangers in the lookout station on White Mountain.

NATURE

**Forest Fire Under Control**

The fire in Smokey Mountain Park has been put out. Firemen think it was caused by a burning cigarette thrown from a car.

PEOPLE

**Rangers Put Out Fire**

A broken glass bottle and the heat of the sun started the fire in Blue Ridge Park. The fire was quickly put out by the fast action of the Park ranger.

PEOPLE AND NATURE

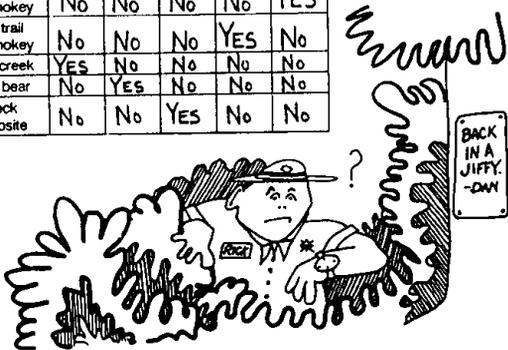
Forest Rangers do many things to help the 'balance of nature'. Ranger Dan has five things planned to do today. He is going to stock the creek with baby trout, move a troublesome bear to a new place, and check the campsite for litter that could be harmful to animals. He is also going to clear the hikers' trail on Mt. Smokey and plant some new pine tree seedlings there.

His partner, Ranger Rick, wants to find him but doesn't know at what time he will be there. Help Rick figure out when Ranger Dan will be at each place. Rick has the following information.

1. Ranger Dan will not go to Mt. Smokey before 3:00 p.m.
2. Ranger Dan won't stock the creek or move the bear after 1:00 p.m.
3. Ranger Dan will only clear the trail or stock the creek on the hour.

Directions: Write 'no' or 'yes' in every box where you know the answer. Once you have a 'yes', all the other boxes in that row or column must be a 'no'. Remember that Ranger Dan will only be at each place once.

	10:00 a.m.	11:30 a.m.	1:30 p.m.	5:00 p.m.	9:30 p.m.
Plant trees on Mt. Smokey	No	No	No	No	YES
Clear trail Mt. Smokey	No	No	No	YES	No
Stock creek	YES	No	No	No	No
Move bear	No	YES	No	No	No
Check Campsite	No	No	YES	No	No



Worksheet 4



Wood pulp is the main material used to make paper. If used paper is chopped up and remade into new paper, fewer trees will have to be cut. This is called recycling paper. Recycling is a great help in saving our forests. By saving your newspapers and bringing them to be recycled, you will help save our trees.

Directions: Fill in the blank spaces with the correct words.

1. Recycling paper saves TREES.
2. A large group of trees is called a FOREST.
3. When paper is chopped up to make paper, it is called PULP.
4. Using old paper to make new paper is called RECYCLING.
5. You can save trees by recycling PAPER.

paper pulp forest trees recycling

Worksheet 1

### How Paper is Recycled

Cut out the puzzle pieces on this page. Then assemble them in their proper order.



Worksheet 2

Directions: Read the sentences. Circle the correct word.

1. You have (heard) hear ) that paper comes from trees.
2. Did you know that paper can be ( make, made) from old used paper.
3. It is (called, calling ) recycling paper.
4. Cardboard ( come, comes) from old paper with the ink left in.
5. Paper companies are ( cut, cutting) down more and more trees to make paper.
6. New trees are not (growing, grew) fast enough to replace trees that are cut.
7. Some companies are ( chop, chopping) down trees in our national forests.
8. If we recycle our paper, we can help to (save, saves ) some of our trees.
9. You can collect old newspapers and (take, took ) them to a recycling center.
10. You can ( recycling, recycle) paper at home and at school.
11. (Use, Used ) the back of old paper for scratch paper.
12. Can you ( thinks, think) of other ways to recycle paper?

Worksheet 5

Fill in the missing numbers on the calendar.

July						
Sun.	Mon.	Tue.	Wed.	Thu.	Fri.	Sat.
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

Use the calendar to answer the questions.

- Andrew is going to start collecting newspapers on July 2nd. What day of the week is that? WEDNESDAY
- By the first Sunday in July he has collected 30 pounds. What date is that? July 6th
- He must have all his papers collected on the last day of the fourth week. What day is that? SATURDAY
- He has to take his papers to the recycling center on July 28th. This day is called MONDAY.
- The last day of the month is THURSDAY, July 31. This is when the recycling center takes all the papers to the paper company.

Worksheet 6

Recycling is one way people are helping the "balance of nature." By recycling materials, we save many of the natural resources needed to make the things we use and can make money too.



Directions: Read how much money each person made. Write the amounts in standard notation.

- Joan collected newspapers for recycling. She sold them to a paper pulp company for two dollars, one quarter and four pennies. \$ 2.29
- Jack and Bob cashed in their aluminum cans. They made three dollars, four dimes and one nickel. \$ 3.45
- Sally returned her deposit bottles to the store. She got one dollar, two quarters, one dime and one nickel. \$ 1.65
- Rex saved cardboard which he sold to a scrap dealer. He made three dollars, two dimes and four pennies. \$ 3.24
- The Boy Scout troop saved magazines for a whole year. When they sold them, they made thirty two dollars, one quarter, one dime and two pennies. \$ 32.37
- Jennifer saved magazines. The scrap dealers do not want them because much of the paper is coated with plastics and cannot be easily recycled. Jennifer gave them to the hospital instead. She didn't make any money, but she did make lots of friends.



Worksheet 7

Recycling Newspapers

Old newspapers can be recycled. that means they can be used again instead of being thrown away or burned. You should save your old newspapers and take them to a paper mill. Paper mills will pay you money for bringing in old newspapers.

The paper mills have their own ways of making the old newspapers into new paper. They soak the newspapers with water and beat the pulp with paddles. Then the wet pulp is put through heated drying rollers. These rollers squeeze the water out of the pulp and dry it into new paper and cardboard.

When we use paper which has been recycled, we are saving trees. It takes about seventeen trees to make one ton (2,000 pounds) of paper.

Directions: Answer the questions

- What can you do with old newspapers besides throwing them away, making paper hats, or burning them?  
TAKE THEM TO A PAPER MILL.
- What does recycle mean?  
TO USE AGAIN
- When the paper mills make paper from trees, they use wood chips from trees and cook them with water to make pulp. To make recycled paper, what do the paper mills mix with water to get pulp?  
NEWSPAPERS
- How many trees does it take to make one ton of paper?  
IT TAKES SEVENTEEN TREES.
- What do you think is one of the most important reasons for recycling newspaper?  
TO SAVE TREES.

Worksheet 8

Directions: Use this code to read the message.

A	B	C	D	E	F
2	4	6	8	10	12
G	H	I	J	K	L
14	16	18	20	22	24
M	N	O	P	Q	R
26	1	3	5	7	9
S	T	U	V	W	X
11	13	15	17	19	21
Y	Z				
23	25				Good Luck!



PAPER IS MADE FROM  
 TREES IS SOMETHING WE  
 ALL KNOW SO IF WE WASTE  
 OUR PAPER MORE TREES  
 WILL HAVE TO GO

Worksheet 10

Directions: Read the problems. Write the numerals on the blank spaces.

1. Carole and Judy are saving cans for recycling. They each have eight cans so far. How many cans do they have together?

8 x 2 = 16 cans

2. Tom, Dick and Harry are saving cans too. They have each saved nine cans. How many cans do they have all together?

9 x 3 = 27 cans

3. Six girls in the third grade each saved seven stacks of newspapers. How many stacks of newspapers do they have in all?

6 x 7 = 42 stacks of newspapers

4. Bob and Betty saved four boxes of glass bottles. Each box had eight bottles in it. How many bottles did they have all together?

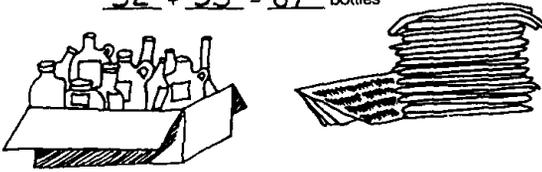
4 x 8 = 32 bottles

5. Jim and Mary were saving bottles too. They had five boxes of bottles. Each of their boxes had seven bottles in it. How many bottles did Jim and Mary have?

5 x 7 = 35 bottles

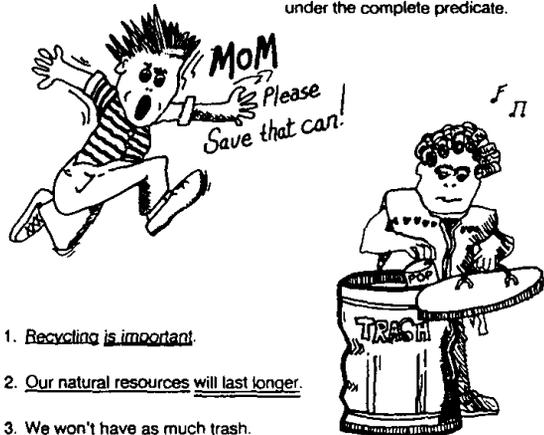
6. If Bob and Betty put their bottles together with Mary and Jim's, how many will they have in all?

32 + 35 = 67 bottles



Worksheet 11

Directions: Draw one line under the complete subject. Draw two lines under the complete predicate.



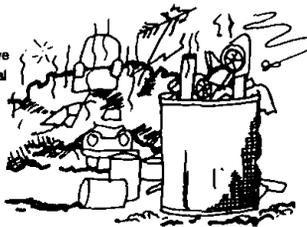
- Recycling is important.
- Our natural resources will last longer.
- We won't have as much trash.
- Many materials can be recycled.
- Glass, tin, aluminum and paper can be used to make new things.
- All of us can save newspapers for recycling.
- Some paper companies will buy old newspapers.
- People can save energy and money too.

Worksheet 12

Directions: Read the story then answer the question below.

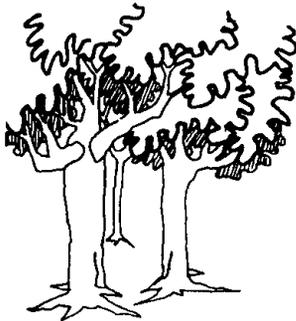
**Recycling**

Recycling means the reuse of materials that we have thrown away after using them in their original form. We can recycle glass, aluminum, tin, paper and many other materials. Recycling can mean shredding old cans and cars and melting the pieces to make new metal for new cans and new cars. It can also mean crushing bottles into tiny glass bits and melting these bits to make new glass. Lots of materials can be recycled.



There are two main reasons for recycling materials. First, America is running out of raw materials to make new products. By using the same materials over and over again, we can help save our natural resources.

The second reason why we should recycle materials is to get rid of our growing piles of trash. When we throw used bottles and cans away, they become trash. Since there are more people in America today, there is also lots more trash. Getting rid of all the trash is one of our biggest problems. By recycling we reuse our trash instead of having to get rid of it. This solves part of our problem of what to do with the trash.



Why is it important to recycle materials?

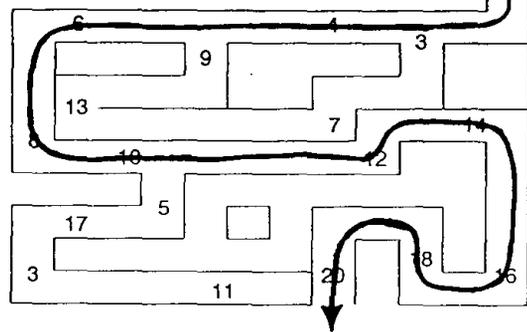
- To save AMERICA'S NATURAL RESOURCES. BY USING THE SAME MATERIAL OVER + OVER, WE WON'T RUN OUT OF RAW MATERIAL.
- To GET RID OF OUR GROWING PILES OF TRASH. BY RECYCLING WE REUSE OUR TRASH INSTEAD OF HAVING TO GET RID OF IT.

Worksheet 13

Joe and Betty are helping to save our natural resources. They are taking used cans, paper and glass to the recycling center.

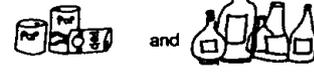
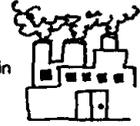


Directions: Help them find their way. Follow the path with the even numbers.



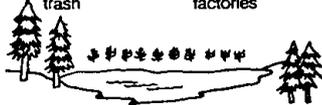
Worksheet 14

Directions: Use the pictures to read the story.

The  in Miss Simmon's class are saving things to be recycled. They are saving  and  too. The used  can be melted in  to make new . Old  can be made into new . This will help to save our  and we will have less .

Write these words next to the pictures:

trash      factories      natural resources

 NATURAL RESOURCES

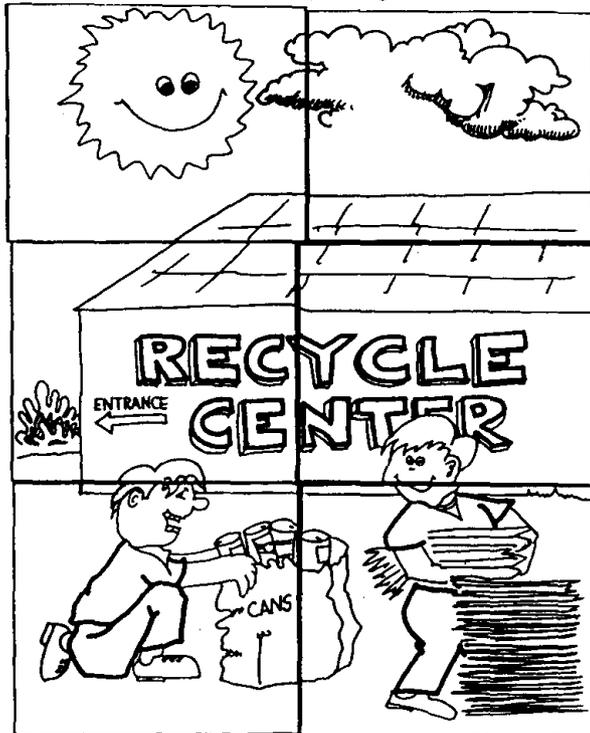
 FACTORIES

 TRASH

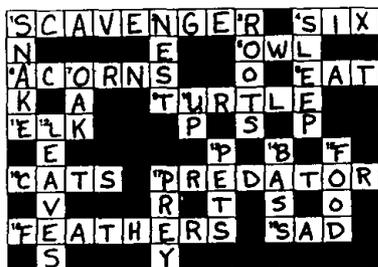
Worksheet 15

Here is one way to save our natural resources.

Directions: Cut out the pieces. Put the puzzle together.



Worksheet 16



Use these words:

- |           |          |       |          |      |
|-----------|----------|-------|----------|------|
| scavenger | turtle   | food  | acorns   | prey |
| eat       | leaves   | sad   | feathers | six  |
| cats      | nest     | roots | snake    | up   |
| oak       | predator | sleep | bass     | owl  |
| elk       | pets     |       |          |      |

Across

- Animal that feeds on dead bodies of animals which they did not kill.
- Number of legs an insect has.
- Animal that does give a hoot.
- Nuts produced by oak trees and eaten by deer, turkeys and squirrels.
- What animals do with their mouths.
- Reptile that carries its home on its back.
- Large deer-like animal that once lived in Nebraska.
- House pets related to mountain lions.
- What we call an animal that captures and eats another animal.
- Outer covering of birds.
- What we would be if there were no animals in Nebraska.

Down

- Reptile without legs.
- Birds lay eggs in this.
- Part of tree below ground.
- What people and some animals do at night.
- Type of tree that produces acorns.
- Opposite of down.
- The green parts of a tree that make food for the tree.
- Dogs and cats make good \_\_\_\_\_ but wild animals do not.
- Type of fish that eat bluegills and rhymes with pass.
- Something animals and people must have to live.
- What we call an animal that is captured and eaten by another animal.

Worksheet 1

We know that a 'habitat' is a place where plants and animals naturally live and grow. Every plant and animal has its own special habitat which provides food, water and shelter.

These habitats are part of even larger areas called 'biomes'. Each biome has a special climate, type of soil, and living conditions which provide habitats for certain plant and animals.

The forest is one biome. Evergreen trees, such as firs, spruce and pines grow in the forest biome. Animals, like deer, bears and squirrels are also found here.

The desert is another biome. Lizards, tortoises and some snakes make their home in this biome. Plants, like the cactus, grow well in the desert.

Other biomes include the grassland, cliffs, ocean, tropical forest and tundra.

The plants and animals below have been listed in the biome where their habitats are usually found. There is one mistake in each list. Cross out the name of the plant or animal whose habitat is not usually found in that biome.

Desert Biome

- Tortoise
- Cactus
- ~~Polar Bear~~
- Camel

Tundra Biome

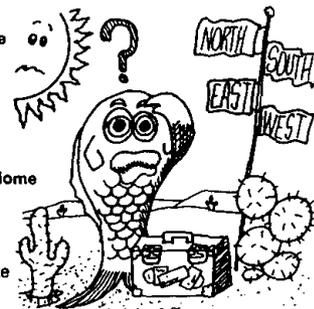
- Penguin
- Seal
- Reindeer
- ~~Tiger~~

Ocean Biome

- Whale
- ~~Cow~~
- Seaweed
- Eel

Grassland Biome

- ~~Dolphin~~
- Rabbit
- Blackbird
- Rattlesnake



Worksheet 1

Directions: Use the chart to answer the questions below.

Animals move at different speeds for different reasons. A cheetah can run very fast to catch another animal for food. A snail crawls very slowly over a leaf to look for its food.

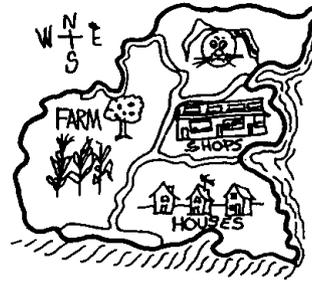
How Fast Can These Animals Go?

Lizard	18 mph. (miles per hour)
Cheetah	63 mph.
Pronghorn Antelope	55 mph.
Ostrich	30 mph
Dolphin	25 mph

- Write the name of the fastest animal. CHEETAH
- How much faster is the ostrich than the dolphin? 5 mph
- How much faster is the pronghorn antelope than the lizard? 37 mph
- How much faster is the cheetah than the pronghorn antelope? 8 mph
- Could the cheetah catch the dolphin? No Why or why not?  
BECAUSE THE DOLPHIN LIVES IN THE OCEAN.



Worksheet 2



Rabbit Island is home for more than 20,000 rabbits. Changes are being made on the island which are causing problems for the rabbits.

Directions: read the problems to see what changes are being made. Do the work.

- There are 325 acres on Rabbit Island. A farmer has bought 90 acres to grow corn. How many acres are left for the rabbits to live on?  
Color the farm area on the island.  
 $325 \text{ acres on the island} - 90 \text{ acres for the farm} = 235 \text{ ACRES}$
- A builder has bought 143 acres of the land that is left to build house on. Now how much of the island is left for the rabbits?  
Color the housing area on the island.  
 $235 \text{ ACRES} - 143 \text{ ACRES} = 92 \text{ ACRES}$
- A shopping center is being built for the people who will live in the houses. The shopping center needs 48 acres of land for stores and parking. How many acres do the rabbits have now?  
Color the shopping center area on the island.  
 $92 \text{ ACRES} - 48 \text{ ACRES} = 44 \text{ ACRES}$
- Roads were needed by the people. The roads took up 15 more acres. How many of the original 325 acres do the rabbits have now?  
Color in the road area.  
 $44 \text{ ACRES} - 15 \text{ ACRES} = 29 \text{ ACRES}$

What do you think will happen to the rabbits?

Worksheet 3

Doyle School  
10740 Wunderlich Ave.  
Cupertino, CA 95014

Sept. 18, 1990

National Wildlife Federation  
1412 16th St., N.W.  
Washington, DC 20036

Dear Mr. Smith,

Last Tues. our class was talking about building a wildlife habitat in part of our school playground. We understand that you have a Backyard Wildlife Program which will provide directions. Please send us the information we will need.

Thank You,

The students in Rm. 15

Write the words that have been abbreviated in the letter.

- Ave. AVENUE CA CALIFORNIA  
 Sept. SEPTEMBER St. STREET  
 Mr. MISTER Tues. TUESDAY  
 Rm. ROOM N.W. NORTHWEST

Worksheet 4



Directions: On the line at the right of each sentence write the adjective that describes the underlined noun.

Adaptation

- The living things that have the greatest chance of survival are the ones that can adapt themselves to their surroundings. LIVING
- Some plants and animals change their color, body structure, or food habits to survive. Body
- These changes happen over a long period of time. LONG
- The cactus is a good example of a plant that has adapted to changing temperatures. CHANGING
- It can hold large amounts of water for a long time. LARGE
- This is why it can live in the hot desert where water is scarce. HOT
- Moths that live in smoggy cities have been known to change their color from white to grey. CITIES
- This color change helps them to better hide from their enemies. CHANGE
- Some animals have developed longer legs for running, sharper claws for digging or the ability to change colors. SHARPER
- You are adaptable if you can change when various things around you change. VARIOUS

Worksheet 5

**Adaptation**

Plants and animals must be able to adapt to live. This means that if their habitat changes, the plants and animals must adapt, or change, too.

Some animals adapt by changing their habitat. For example, some birds live best in places where the weather is warm. If the weather changes and becomes cold, they can fly far away to another warm place.

Some animals adapt by changing what they eat. Seagulls can eat fish, but if there are no fish, they can eat many other things, too.

People can adapt by using their brains and hands to build or make things.

If the weather gets cold, people can put on a coat or build a warm house.

People can adapt or change more than any other animal.

Directions: Find the answer to the silly riddle. Use the story to find the letters that match the numerals under the spaces.



Why do birds fly south in the winter?

BECAUSE ITS  
1 2 3 4 5 6 7 8 9  
TOO FAR TO  
8 9 10 11 12  
WALK!  
12 13 14

**Endangered Animals**

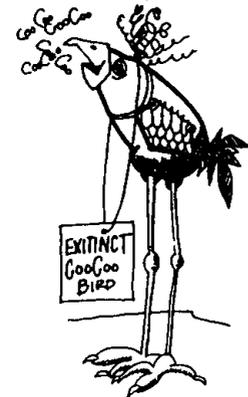
Directions: Read the story. Use the information to answer the questions. Be sure to write your answers as standard numerals.

The United States government began keeping lists of endangered and threatened wildlife in 1967. They now list one hundred seventy-four kinds of endangered animals and eleven more that are threatened.

Many of these animals are found in Nebraska. It is believed that there are now less than fourteen Black-footed Ferrets still alive. The Swift Fox population is low due to the changing conditions of grasslands to agricultural land in Western Nebraska.

Laws and wildlife management have helped some animals. For example, in 1956 there were about twenty-one Whooping Cranes alive. A national refuge was built to protect their habitat and, at last count, in 1980, there were more than ninety-nine birds alive.

We can protect our wildlife.



Answer these questions.

1. The United States government lists 174 kinds of endangered animals.
2. There are 11 more animals that are threatened.
3. There are less than 14 Black-footed Ferrets still alive.
4. The Swift Fox population is said to be LOW.
5. The Whooping Crane population has grown from 21 in 1956 to 99 in 1980.

**Endangered Animals**

Many animals are in danger of becoming extinct. Extinct means that there are not (and never will be) any more of those animals. Dinosaurs are extinct animals.

Animals become endangered for many reasons. Some die because people have moved into places where they live. Then the animals have no place to find food or build their homes. Others are killed for their fur or skins to make coats and other clothing. Some animals are killed because people are afraid of them. Some are killed for sport by hunters.

Here are a few of the animals that are endangered. Draw a line from the animal to the reason you think it might be endangered.



- Cheetah
  - Timber Wolves
  - Pine Barrens Tree Frog
  - Elephants
  - Pelicans
- People have cut down the trees where this animal makes its home.
  - This animal is killed by farmers to protect their herds of cattle and sheep.
  - This animal is hunted for its beautiful fur. The fur is used to make coats.
  - These animals have been killed by eating poison that farmers spray on crops to kill insects. Fish eat plants that have the poison in them and then these animals eat the fish.
  - People have moved into places where these animals live. They need a place of their own.

Directions: Do the problems. The letter under your answer will help you solve the code. Match your answer to the numbers under the blank spaces below. Write the correct letter on the space. You will find the names of two extinct animals in Nebraska.



487 ±962 1,449	906 ±638 1,544	697 -482 208	321 ±598 919	987 -354 633	546 ±293 839	638 -389 249
423 ±117 540	328 ±169 497	469 -135 334	596 -444 152	6,856 -6,828 28	7,846 -5,388 2,458	6,487 ±1,269 5,218

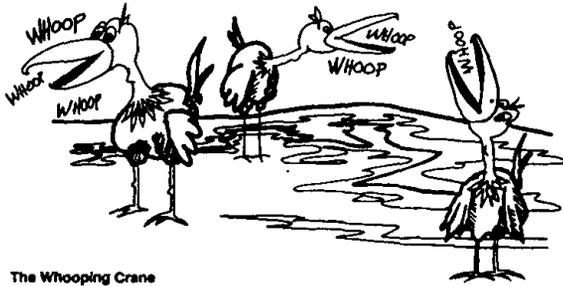
P A S S E N G E R  
2458 249 839 839 28 633 152 28 919

P I G E O N  
2458 334 152 28 208 633

and the

C A R O L I N A  
497 249 919 208 1544 334 633 249

P A R A K E E T  
2458 249 919 249 540 28 28 1449



The Whooping Crane

The whooping crane is an endangered species. Thirty years ago there were only 21 whooping cranes alive in the world. In 1960 the number had grown to 99. Some people who cared about the whooping crane got laws passed to protect the cranes' winter home in Texas. They also began taking some eggs from the wild cranes and raising the baby chicks.

Whooping cranes usually lay two eggs at a time, but only one chick grows up. The babies fight, and the stronger chick steals the food from the weaker one. To stop this, scientists keep baby cranes in pens with baby turkeys. During fights, the turkeys can outrun the cranes and they don't get hurt. Sometimes scientists put whooping crane eggs into the nests of other birds. These different birds will raise the baby whooping crane as their own.

People who care may be able to save the whooping crane from becoming extinct.

Write "yes" or "no" after each sentence.

1. The whooping crane is an endangered species. YES
2. The cranes' winter home is in California. NO
3. Sometimes whooping crane chicks are raised with turkeys. YES
4. Whooping cranes got laws passed to protect their winter homes. YES
5. There are more whooping cranes alive today than 30 years ago. YES

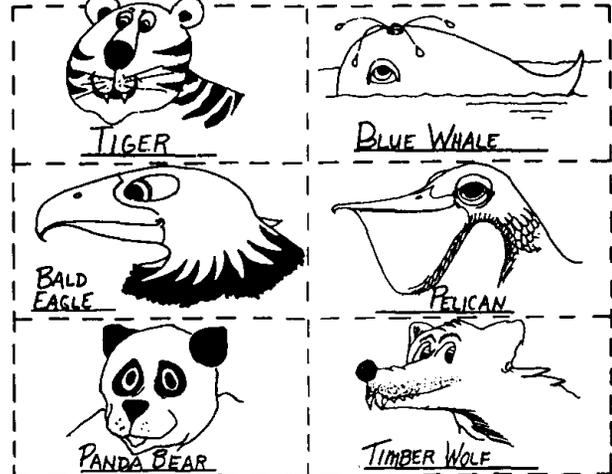
Worksheet 4

Endangered Animals

Some animals are endangered. This means that there aren't many left. Some animals are endangered because the weather changes, they can't get enough food or water, or their habitat is destroyed. Sometimes, people kill too many animals and they become endangered.

Directions: Write the names of these endangered animals on the spaces under the picture.

- Blue Whale      Timber Wolf      Tiger  
Brown Pelican      Bald Eagle      Panda Bear



Worksheet 5

Directions: Read the story. Below the story are some new words. Draw a line from the word to its meaning.

Endangered Animals

Many animals are close to extinction today. There are many reasons why this is so. Some animals have decreased in number for hundreds of years due to changes in climate and vegetation. For example, the giant panda and the whooping crane are both rare probably for these reasons. Other animals such as the North American bison and the tiger are rare because of senseless and destructive hunting. Probably most endangered animals are threatened because of man moving into the places in which they live.

For example, when the first settlers were moving across America's "Wild West", the herds of bison (or buffalo, as they are sometimes called) seemed limitless. There were probably sixty million bison roaming the plains in herds that often had several thousand animals. As the settlers spread across the prairies, the hunters went ahead. Sometimes they were employed to supply meat for workmen on the railroads, but often the slaughter was far greater than was needed. At that time it seemed that the bison would last forever - but by the beginning of this century there were only a few hundred left throughout America. By careful conservation, man has now managed to re-establish several large herds, and in the National Parks of Canada and the U.S.A. these magnificent animals can once more be seen.

- |              |                                       |
|--------------|---------------------------------------|
| decreased    | plant life, growing plants            |
| vegetation   | never ending                          |
| rare         | protecting from loss or being used up |
| senseless    | became less                           |
| limitless    | splendid; grand; wonderful            |
| employed     | foolish; stupid                       |
| slaughter    | unusual, seldom seen or found         |
| conservation | give work and pay                     |
| magnificent  | killing; butchering                   |

Worksheet 6

Directions: Read the story. Find the words below in the story and draw a line under them. Write the words in alphabetical order on the spaces below the story.

- disappear      crocodiles      species      entire  
pandas      extinct      destruction      people  
societies      continue

Disappearing Animals

Animals are always changing. Just as new ones appear, so other disappear. Some, like the crocodile, have remained the same for millions of years, while others are changing rapidly. In the last few hundred years, man has spread out over the whole world. In doing so, he has killed millions of animals. Some have been killed for food, some because they were pests, some for sport, and some for their furs.

Man has also wiped out entire species of animals. Once a species is extinct, there will never be any more.

More and more people are becoming aware of this and trying to stop the destruction of wildlife. Societies like the World Wildlife Fund buy land where animals can live in peace. Governments protect animals so that their people can enjoy seeing them. Wild animals should be for everyone, not just for a few hunters.

If we want to continue to see leopards, tiger, pandas, crocodiles and other animals, we must make sure that they do not become extinct.

1. CONTINUE
2. CROCODILES
3. DESTRUCTION
4. DISAPPEAR
5. ENTIRE
6. EXTINCT
7. PANDAS
8. PEOPLE
9. SOCIETIES
10. SPECIES

Worksheet 7

Directions: Read the story. At the bottom of the page, underline the best sentence that tells the main idea of each paragraph.

**Birds of Prey**

(1) America's birds of prey, such as eagles, hawks and owls, are in trouble. Several species are now "endangered". There are three main causes of the trouble.



(2) Pesticides have been sprayed on many of our farm crops. Some of these chemical poisons have passed through nature's food chain and ended up in birds' bodies. This has caused some birds to stop laying eggs. Other birds lay eggs with shells so thin that the eggs break when the parent bird sits on them.

(3) Thoughtless people have also killed many adult birds or destroyed their nests. These people often thought that the birds were pests and that they were eating the crops. But, birds of prey are really the farmers' friends. They eat mice, rabbits and other small animals that can destroy crops.

(4) People have also destroyed the birds' habitats. They have built houses, factories and highways where the birds live. They have also dug mines, cut forests and plowed the lands where the birds naturally nest and hunt.

Birds of prey are important to the balance of nature. We all need to work together to protect these birds.

**Paragraph 1**

- A. Eagles are birds of prey.
- B. Many birds of prey are in trouble
- C. Parrots are an endangered species.

**Paragraph 3**

- A. Many birds are killed by people.
- B. Birds eat mice and rabbits
- C. Farmers grow many crops.

**Paragraph 2**

- A. Some birds lay thin-shelled eggs.
- B. DDT is a pesticide.
- C. Pesticides are dangerous to birds.

**Paragraph 4**

- A. People cut down forests for timber.
- B. Birds don't like factories.
- C. Many bird habitats have been destroyed by people.

**Worksheet 8**

Directions: Read the story. Draw a line under all the number words. Answer the questions at the bottom of the page.

**The Giant Panda**

The giant panda is probably the rarest of all animals. Although the panda looks like a bear, it is actually related to the raccoon. It can only be found in one place in all the world - the bamboo jungles between China and Tibet. Perhaps it is called "giant" because it grows to a weight of three hundred pounds and a length of five feet. It is an endangered animal mostly because of over-hunting and the many numbers who have been caught for zoos. In 1936,



the first live giant panda brought to the United States weighed only five pounds. It cost nearly nine thousand dollars. Fifteen months later, the giant panda, "Su-Lin" died at the Brookfield Zoo in Chicago.

Use the story to answer the questions. Write your answers as standard numerals.

1. How much can a grown giant panda weigh? 300 POUNDS
2. How tall does a giant panda get to be? 5 FEET
3. How much did the first giant panda cost the zoo? 9,000 DOLLARS
4. How long did the giant panda live at the zoo? 15 MONTHS

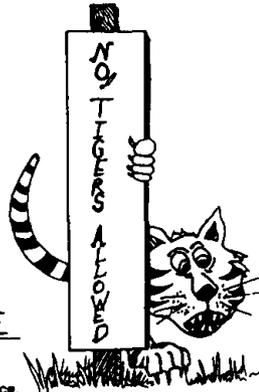
**Worksheet 9**



Many plants and animals cannot live where there are lots of people. As people build more and more houses and roads, the animals must move. Often, when animals are forced to leave their natural habitats, they die.

Directions: Use the sign to fill in the blanks.

1. The fourth letter of the second word E
2. The first letter of the first word N
3. The last letter of the last word D
4. The first letter of the third word A
5. The same as number 2 N
6. The third letter in the second word G
7. The sixth letter in the third word E
8. The fifth letter in the second word R
9. The letter before the fifth letter in the second word E
10. The fifteenth letter in the phrase D



Use the letters in the blanks to complete the sentence.

When there are very few of a kind of plant or animal left alive, we say they are

E N D A N G E R E D

**Worksheet 10**

Jerry lives on a small farm. Houses have been built on the lands around the farm. Jerry has made a chart to show how many animals lived near the farm before the houses were built. His chart also shows how many of these animals are living near the farm now.



Directions: Jerry wrote the numbers as Roman numerals. His chart would be easier to read if the numbers were written in standard notation. Change the Roman numerals to standard notation. Write the numerals on the blank spaces.

Animals Near the Farm		
Animal	Before the houses were built	After the houses were built
Beavers	XX <u>20</u>	XI <u>6</u>
Coyotes	VI <u>6</u>	II <u>2</u>
Raccoons	XII <u>12</u>	VII <u>7</u>
Rabbits	IX <u>9</u>	XVI <u>16</u>
Deer	V <u>5</u>	I <u>1</u>
Field Mice	VII <u>7</u>	XVIII <u>18</u>
Foxes	XIV <u>14</u>	III <u>3</u>

Are there more of some animals since the houses were built? **YES**

Can you think of a reason why?

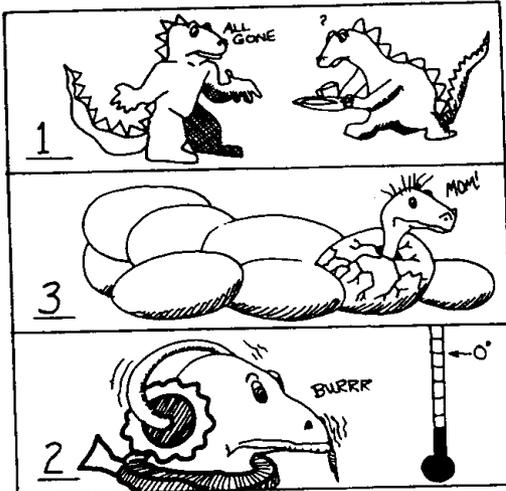
**Worksheet 11**

**Extinct Animals**

Animals or plants that once lived on the earth, but are no longer alive are called extinct. Dinosaurs are a good example of animals that are extinct. Dinosaurs were large lizards that lived in warm places. They needed lots of food, water and space to survive.

**Directions:** Match the picture to the sentence that tells why dinosaurs became extinct. Write the numeral of the sentence under each picture. Color the pictures.

1. There was not enough food or water.
2. The climate became too cold.
3. Few baby dinosaur eggs hatched.



Worksheet 12

**Humans Have Polluted Their Environment In Many Different Ways.**

Put numbers in front of each set of sentences to show the order in which they happen.



- 2 People began spraying poison on crops to kill the insects.
- 1 Insects ate many crops.
- 3 Poisons also killed birds and other animals that ate the insects.

- 3 The animals that live in the streams and rivers began to get sick and die.
- 2 Some factories pour used, dirty water back into the streams and rivers.
- 1 Factories were built to make more things for people.



- 1 People made more and more cars.
- 2 Fumes from cars put poisons into the air.
- 3 Trees and plants in the cities began to get sick and die.

- 3 Litter is not nice to look at and can hurt animals.
- 2 More people made more litter.
- 1 There are many more people on the earth today.



Worksheet 1

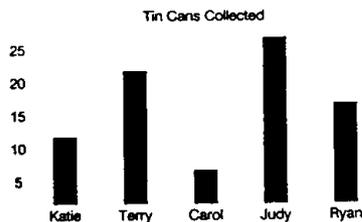
Mrs. Black's class has just read a booklet called "Deadly Throwaways". It told them some reasons why litter is harmful to animals. Here are some things they learned. Birds can get hung up in strings. Animals can choke on pop tops and plastic wraps. Small animals can fall into bottles or cans. If they can't get out they are either fried, frozen or starved to death. Garbage that is thrown out of cars attracts animals to the highways where they can get hit by passing cars. Litter can really be dangerous for animals. To help fight litter the students decided to have a clean-up day. They formed groups to pick up litter in the neighborhood.



Read the problems. Solve the problems, read carefully!

1. Mike, Sam and Jake walked for about one mile while they picked up pop cans. Mike found 5 more than Sam who found 18. Jake collected 8 less than Mike. How many cans did the boys collect all together?  
**MIKE-23, SAM-18, JAKE-15 56 CANS TOTAL**
2. Sherri, Chris and Pat picked up papers and other litter. Sherri and Chris each filled 4 bags. Pat and Sherri each filled 3 bags. Chris filled one extra bag on the way back to school. How many bags were filled?  
**SHERRI-7, CHRIS-5, PAT-3 15 BAGS TOTAL**

Study this graph:



3. Who collected the most? **JUDY**
4. Who collected the least? **CAROL**
5. Who collected more than Katie but less than Terry? **RYAN**
6. How many did the top 3 can collectors collect in all? **60 CANS**
7. In all, how many did the group collect? **75 CANS**
8. Who collected more, Terry and Ryan or Carol and Judy? **TERRY + RYAN**  
By how many? **5 CANS**

Worksheet 2

**Directions:** Draw a line under the contraction in each sentence.

Write the two words that mean the same as the contraction on the blank spaces.

1. Trash isn't nice to see in parks or playgrounds. IS NOT
2. Don't throw litter on the ground. DO NOT
3. Papers and trash aren't good for plants or animals. ARE NOT
4. If you can't find a garbage can, take your trash home with you. CAN NOT
5. It wouldn't be fun to play in a park covered with litter. WOULD NOT

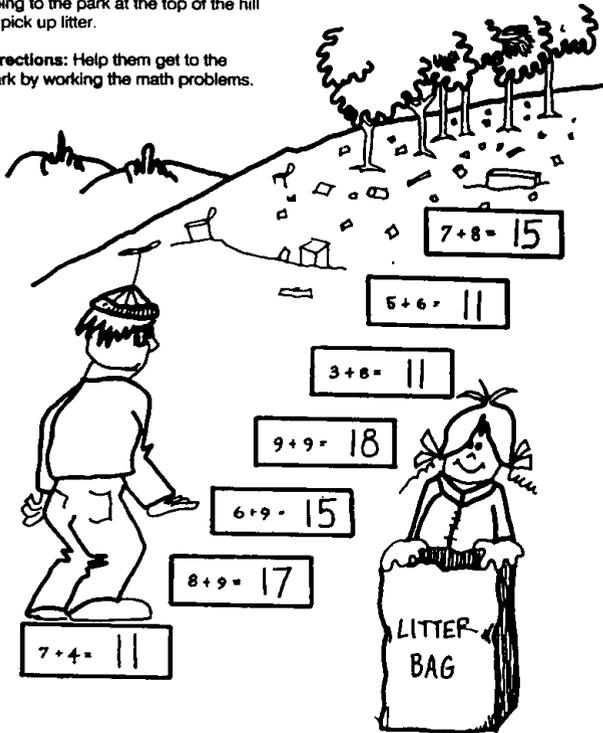
Color the picture. Color over the parts that are not nice to see.



Worksheet 3

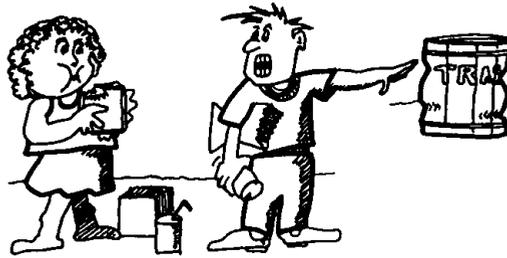
Johnny and Susie want to help keep their environment clean. They are going to the park at the top of the hill to pick up litter.

Directions: Help them get to the park by working the math problems.



Worksheet 4

Read the story. Number the sentences 1, 2, 3 and 4 the way they happened in the story.



Mike and Melissa went to the park. They were going to have a picnic. They brought peanut butter and jelly sandwiches, cookies and two cans of soda.

After they ate their lunch, Melissa wanted to play on the swings. Mike thought they should put their trash in the trash can first. Melissa did not want to be a litterbug, so they picked up the trash. Then they played on the swings.

- 2 They ate peanut butter and jelly sandwiches for lunch.
- 1 Mike and Melissa went to the park for a picnic.
- 4 They played on the swings.
- 3 They put their papers and cans in the trash can.

Worksheet 5

What does Woodsy Owl say?

Directions: Do the problems. Use your answers to find out.



E	$\begin{array}{r} 43 \\ +8 \\ \hline 51 \end{array}$	H	$\begin{array}{r} 72 \\ +9 \\ \hline 81 \end{array}$	T	$\begin{array}{r} 84 \\ +4 \\ \hline 88 \end{array}$	I	$\begin{array}{r} 46 \\ +8 \\ \hline 54 \end{array}$
P	$\begin{array}{r} 83 \\ +7 \\ \hline 90 \end{array}$	O	$\begin{array}{r} 44 \\ +2 \\ \hline 46 \end{array}$	V	$\begin{array}{r} 92 \\ +8 \\ \hline 100 \end{array}$	A	$\begin{array}{r} 35 \\ +7 \\ \hline 42 \end{array}$
D	$\begin{array}{r} 96 \\ +5 \\ \hline 101 \end{array}$	N	$\begin{array}{r} 28 \\ +8 \\ \hline 36 \end{array}$	L	$\begin{array}{r} 46 \\ +9 \\ \hline 55 \end{array}$	U	$\begin{array}{r} 79 \\ +7 \\ \hline 86 \end{array}$

G  $\begin{array}{r} 54 \\ 54 \end{array}$  I  $\begin{array}{r} 100 \\ 100 \end{array}$  V  $\begin{array}{r} 51 \\ 51 \end{array}$

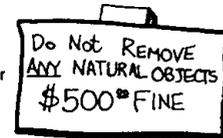
A  $\begin{array}{r} 42 \\ 42 \end{array}$  H  $\begin{array}{r} 81 \\ 81 \end{array}$  O  $\begin{array}{r} 46 \\ 46 \end{array}$  O  $\begin{array}{r} 46 \\ 46 \end{array}$  T  $\begin{array}{r} 88 \\ 88 \end{array}$

D  $\begin{array}{r} 101 \\ 101 \end{array}$  O  $\begin{array}{r} 46 \\ 46 \end{array}$  N  $\begin{array}{r} 36 \\ 36 \end{array}$  T  $\begin{array}{r} 88 \\ 88 \end{array}$

P  $\begin{array}{r} 90 \\ 90 \end{array}$  O  $\begin{array}{r} 46 \\ 46 \end{array}$  L  $\begin{array}{r} 55 \\ 55 \end{array}$  L  $\begin{array}{r} 55 \\ 55 \end{array}$  U  $\begin{array}{r} 86 \\ 86 \end{array}$  T  $\begin{array}{r} 88 \\ 88 \end{array}$  E  $\begin{array}{r} 51 \\ 51 \end{array}$

Worksheet 6

Many parks and natural areas have signs telling people that it is against the law to take rocks, plants or animals home with them. Some people think that one little rock, flower or starfish isn't going to be a big deal. Is it?



Directions: Do the word problems to see what could happen if everyone thought that way.

1. Three classes of students visit Natural Bridges nature area every day. Each class has 30 students. If each student takes home just one little rock, how many little rocks will be gone in one day?

$30 \times 3 = 90 \text{ ROCKS}$

2. How many little rocks will be gone in one week (7 days)?

$90 \times 7 = 630 \text{ ROCKS}$

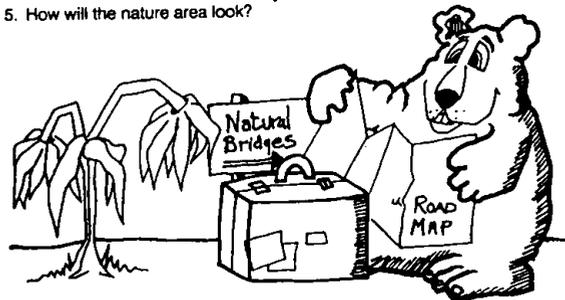
3. How many little rocks will be gone in one month (30 days)?

$90 \times 30 = 2,700 \text{ ROCKS}$

4. How many little rocks will be gone in one year (12 months)?

$2700 \times 12 = 32,400 \text{ ROCKS}$

5. How will the nature area look?



Worksheet 7

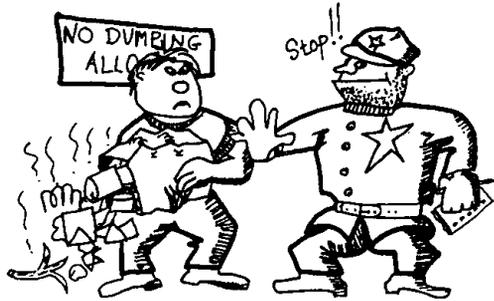
Directions: Draw a line under the compound words you find in the story. Write them on the blank spaces below. Draw a line between the two words that form the compound word.

Many people are working hard to help our environment. They are asking our Congressmen to pass laws to protect our wildlife and prevent pollution.

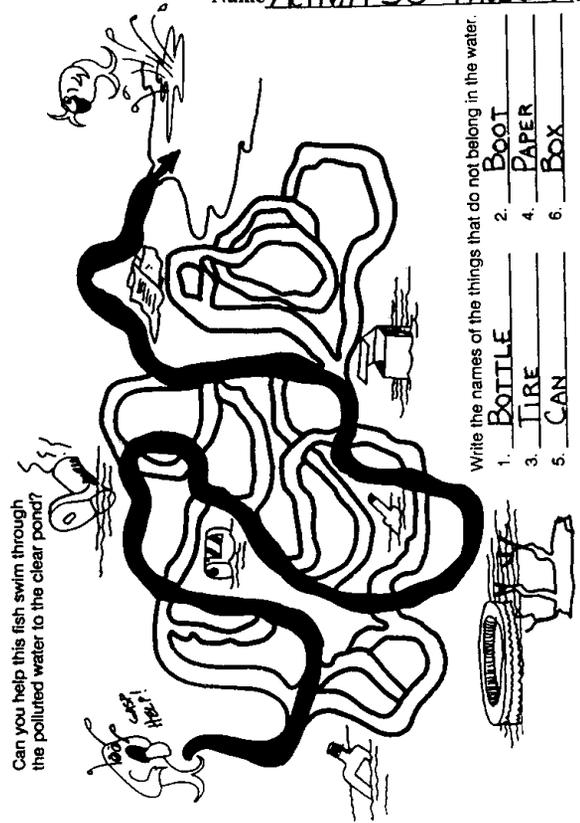
You may know that you can go to jail or pay a fine if you litter our highways. There are also laws against making too much noise and polluting your neighbor. We have laws requiring licenses for fishing and hunting. The money from these license fees is sometimes used to restock rivers and lakes with fish, to replant trees and shrubs along the roadsides, and to make improvements in parks and campgrounds. Laws also limit lumber companies in the amount of redwood trees that they can cut.

Taking care of our environment is a responsibility for everyone.

<u>CONGRESS/MEN</u>	<u>CAMP/GROUND</u>
<u>WILD/LIFE</u>	<u>RED/WOOD</u>
<u>HIGH/WAYS</u>	<u>EVERY/ONE</u>
<u>ROAD/SIDE</u>	<u>SOME/TIMES</u>



Worksheet 8



Write the names of the things that do not belong in the water.

1. BOTTLE
2. BOOT
3. TIRE
4. PAPER
5. CAN
6. BOX

Worksheet 9

Directions: Here is a picture of an Indian village in early California. Make an X on all the things in the picture that are wrong. Do you know why?



Worksheet 10

Directions: Read the story. Draw a line under the best answers to the questions.

Every now and then something happens that shows how people's carelessness can affect other animals in their environment. The animal in this true story is a Risso dolphin, normally found only in mid-ocean.

People at Marineland, a zoo for sea life just south of Los Angeles, began receiving calls reporting that a dolphin, that seemed to be hurt, was seen in San Pedro Harbor. It is against the law to collect dolphins near shore unless they are ill and attempt to beach themselves. The dolphin finally did so and was rescued by the Marineland crew. The dolphin had two main problems - he couldn't swim and he wouldn't eat. The trainers at Marineland patiently tried feeding him and swimming with him in a small tank at the zoo.

At first he began to get better and trainers had high hopes. But then, 10 days after he had been picked up on the beach, the dolphin died. He had not been able to eat. An examination was held, and inside the dolphin were found: 20 to 25 giant 30-gallon plastic trash bags, two plastic 6-pack beer holders, and about 25 feet of plastic twine. In all, there were eight pounds of plastic litter inside the dolphin.

1. A good title for this story would be:  
 It's Fun to Go to the Seashore  
Litter Harms Animals  
 Man Should Not Feed Plastic to Animals
2. The dolphin was first seen:  
swimming in San Pedro Harbor.  
 at Marineland.  
 in mid-ocean.
3. The Marineland crew tried to:  
 train the dolphin to do tricks.  
 remove the plastic litter.  
get the dolphin to eat and swim.
4. It is against the law to:  
 feed dolphins.  
catch dolphins in the water near shore.  
 help them when they are sick.
5. The dolphin died because:  
 he swam too far from his home.  
 he was old.  
he ate litter left by people.



Worksheet 11

Directions: Read the story. Draw a line through the sentences that do not belong in the story.

**Litter on the Beach**

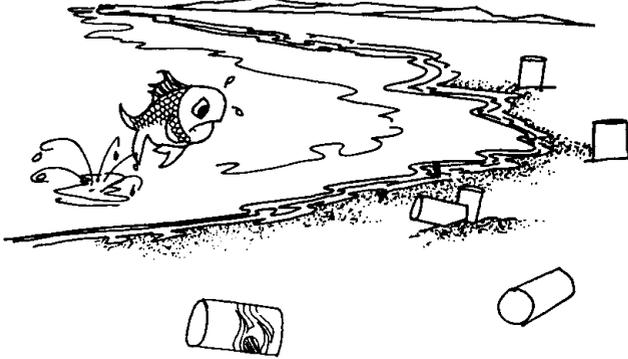
We see all kinds of litter on the beach. The can, bottles and papers that have been left by people are ugly to look at. ~~We like to swim in July.~~

Some beach litter is made of metal. ~~When it rains, the river and lake fill up again.~~ These metal things often have sharp edges which can harm people and wildlife.

Some metals are worse than others. Metals that rust contain iron. ~~Gas exhaust is a major cause of air pollution.~~ You can tell if the metal is iron because it will stick to a magnet. Iron comes from the earth. ~~Trees provide us with wood to build houses.~~ Iron will keep rusting until it is part of the earth again.

~~Sunday is the first day of the week.~~ Some cans are made of aluminum. Aluminum will not rust. A magnet will not stick to it. These cans will never break down and become part of the earth again.

Both kinds of metal litter are bad. ~~We have trash cans in our classes and at school.~~ It takes a long time for cans made of iron to rust. But aluminum cans will litter our beaches forever unless they are picked up.



Worksheet 12

**Sign Up for Conservation**

What do you think these signs mean? Write your answer below each sign.

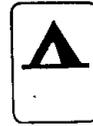
no bikes  
campground



deer crossing

deer crossing  
handicap area

hiking trail  
picnic area



campground



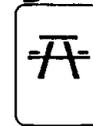
no bikes



hiking trail



handicap area



picnic area

Worksheet 1