

# Learning Through Legacy

Alabama's Environmental Education Guide  
for Grades K-2

Produced for  
**Alabama Educators**

By  
**Legacy, Partners in Environmental Education**



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# INTRODUCTION TO ECOLOGY

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Ecology deals with the relationships living things have to each other and to their environments (surroundings). Scientists who specialize in studying these relationships are called ecologists.

No living thing—plant or animal—lives alone. Every living thing depends in some way on certain other living and nonliving things. Animals and plants that live in the same area, or community, depend on each other in some way. For example, an elephant must have plants for food. If the plants in its environment were destroyed, the elephant would have to move to another area that had plants, or it would starve to death. Plants depend on such animals as the elephants for the nutrients (nourishing substances) they need to survive. Animal wastes and the decaying bodies of dead animals and plants provide many of the nutrients that plants need.

The study of ecology increases people's understanding of the world and all its creatures. This is important because humanity's survival and well-being depend on relationships that exist on a worldwide basis. Change in distant parts of the world—even outer space—affect us and our environments.

One goal of ecologists is to intelligently manage and control the living and nonliving things in the world. Many ecologists study air and water pollution and how dirty air and water affect life. Ecologists try to foresee possible environmental problems, such as crop losses or losses in animal life that building a dam or straightening a river channel may cause. They study such things as insect pests, including the beetle that carried the Dutch elm disease from Europe to the United States where it killed millions of trees.

Ecologists are concerned about the rate at which people are using up such natural resources as coal, gas, and oil. Along with many other scientists, they are searching for ways to use sunlight and atomic energy for fuel and power. Ecologists also are concerned about the world's increasing population and its decreasing food supply. For example, along with marine biologists, they are trying to find new ways of producing food from the sea.

Ecologists use knowledge from many different fields of study including physics, chemistry, mathematics, and computer science. They also rely on other sciences, such as climatology, meteorology, geology, and oceanography, to learn about air, land, and water environments.

Adapted from *World Book Encyclopedia*



## OBJECTIVES:

The student will be able to:

1. Identify ways people use trees.
2. Recognize the parts of a tree and their functions.
3. Name living things that depend on trees.
4. Describe ways people can use trees and ensure we will continue to have them.

## BACKGROUND:

Trees are a valuable resource, both in terms of their environmental and economical benefits. Trees are used to produce many products in the economy as well as provide natural beauty, fresh air, and a means to prevent land erosion.

Many other animals and plants within the environment depend on trees to provide shelter and food. Trees also have various parts that serve many functions. The roots hold soil and take water and other nutrients into the tree. The leaves produce food and release oxygen into the environment. The trunk supports the tree while the bark provides a protective covering. Every part of a tree serves a purpose within the environment as well as in our economy.

## VOCABULARY:

**coniferous tree** - a tree that has cones and is mostly evergreen (A few conifers are deciduous, and some evergreens are not coniferous.)

**deciduous tree**- a tree that sheds leaves during a particular season

**dependent** - needing something else for support to live

## PROCEDURE:

### *Setting the Stage*

1. Display the wood products that have been gathered. Ask students what these objects have in common. Explain that these objects are similar because each has been made from trees.
2. Have the students make a brainstorm list of other objects they know are produced from trees. Record their responses.

### *Activities*

1. Read the book *The Giving Tree* by Shel Silverstein.
2. Identify the parts of the tree and discuss how the boy or man used them to help him live.
3. Have students do the activity "Who Needs a Tree?"
  - Have individual students name parts of a tree. As each student names a part of a tree, let him/her come up to hold the yarn and form a web. Parts of tree may include roots, trunk, bark, or leaves.
  - Using a second skein of yarn of a different color, have students name other organisms (animal or plant) that live off a tree. Use these students to string a second web over the tree web. Items in this category may include ladybugs, squirrels, moss, or beetles.
  - When every student has had an opportunity to be something that is part of the tree or needs a tree, use scissors to "cut down the tree." Symbolically, this will represent the loss of not only the tree but also the habitat for other organisms that need the tree to live.

## Subjects:

Science, Language Arts

## Time Needed:

45 minutes

## Materials:

*The Giving Tree* by Shel Silverstein  
two skeins of yarn in different colors  
construction paper  
markers  
tree products  
scissors

### *Follow-Up*

1. Discuss how cutting a tree affects other organisms in the environment.
2. Discuss ways people can use trees while continuing to ensure their existence is plentiful.
3. Have the class purchase and plant a tree on the school grounds or in a local park in an effort to replenish trees.
4. Refer to “Speakers for the Earth” in Learning Through Legacy (K-2).

### **EXTENSIONS:**

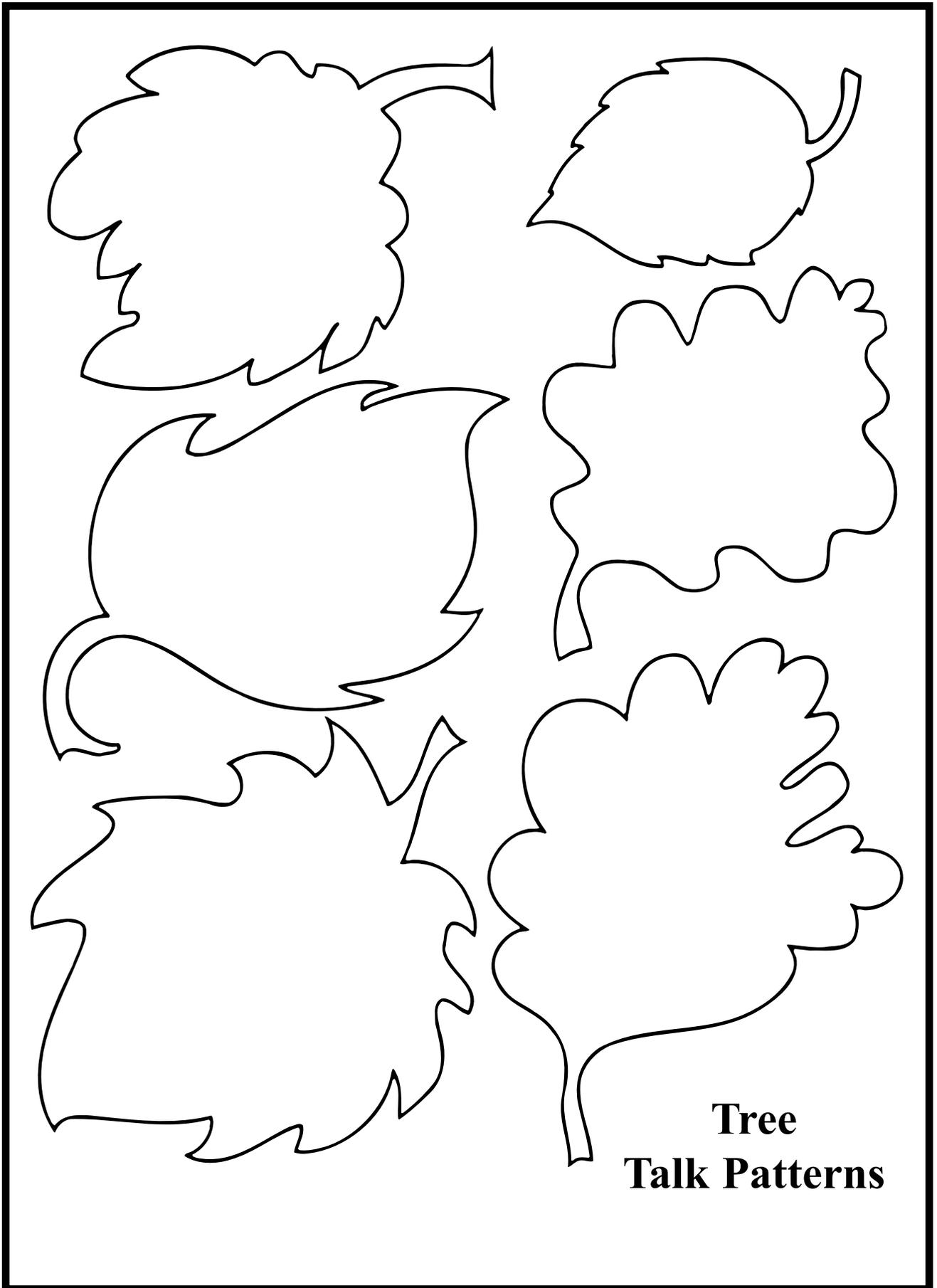
1. Make the “Tree Talk” activity leaves from construction paper. Write questions and tree facts based on the class activity to solicit responses from students. These might include questions concerning the parts of the tree and their function. Name things made from trees. Name things trees need to survive. Discuss why some types of trees may not be around very long. Talk about ways that we can be sure to have trees around for a long time. Count the trees in your yard or on your school ground. Place these in a science or writing center, or divide the class into groups to record and share responses.
2. Have students collect some leaves common to their community. Using a book from the school library, identify some of these common leaves.
3. Define the terms “coniferous” and “deciduous” to students and have them classify different types of trees according to these terms.
4. Ask a member of a local forestry agency to speak to your class.
5. Ask a paper industry representative to speak to your class.
6. Geography Extension: Where would different trees grow? Discuss why or why not. Have students find on a map or globe where trees grow or don’t grow.
7. Graph leaves by type, color, texture, and smell.
8. Refer to “The Gift of a Tree” in Learning Through Legacy (K-2).

### **ORIGINAL DEVELOPMENT RESOURCES:**

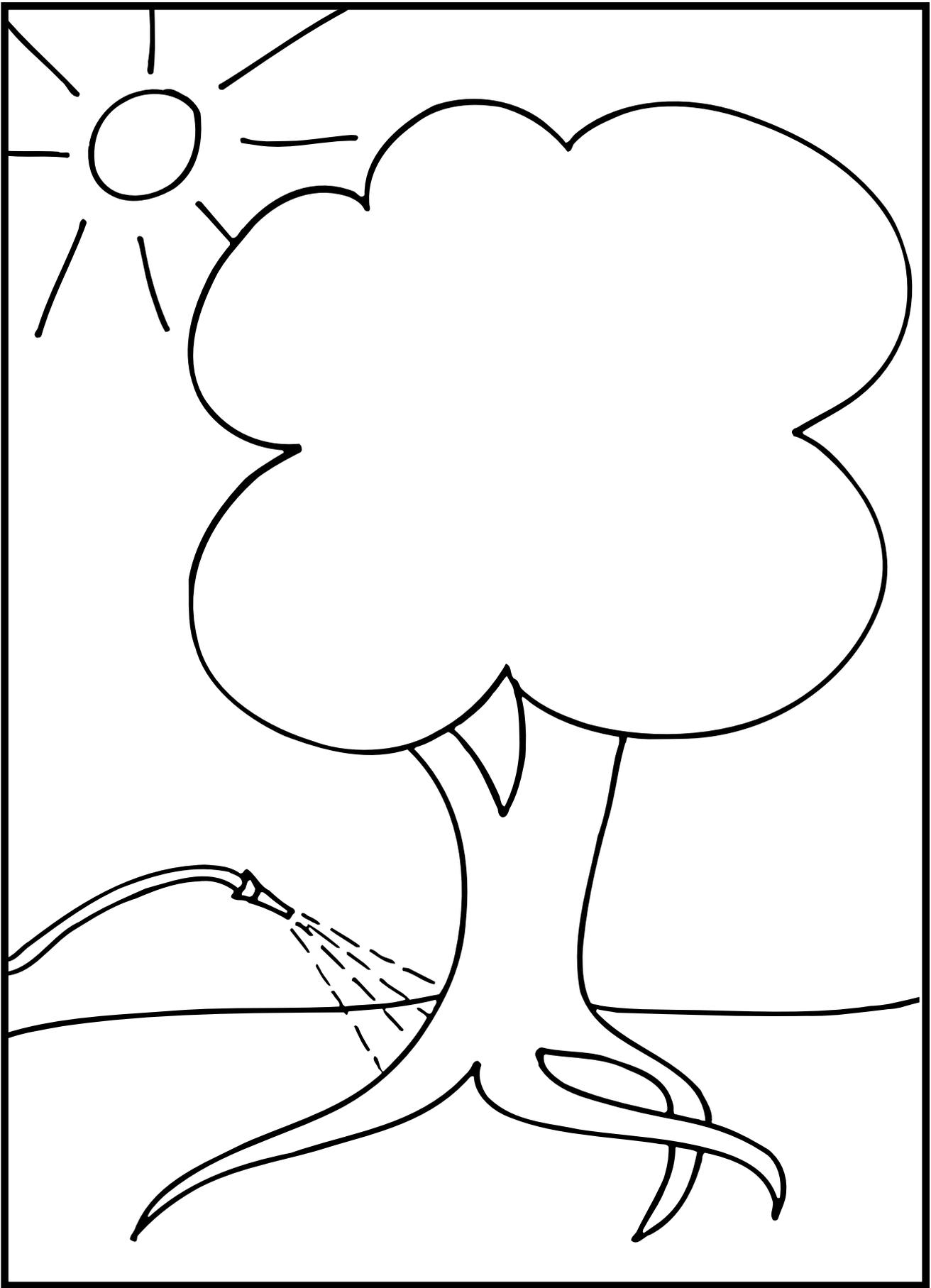
Silverstein, S. (1964). *The Giving Tree*. New York, NY: Harper & Row.

*A Friend in the Backyard*. Georgia Power, A Southern Company. Environmental Teachers Corps.  
[www.southernco.com/site/community/web.teachercorp.asp](http://www.southernco.com/site/community/web.teachercorp.asp)

Smokey Bear resources: Alabama Forestry Commission, PO Box 302550., Montgomery, Alabama 36130 (334-240-9355) USDA Forest Service, 2946 Chestnut, Montgomery, Alabama 36107 (334-832-4470)  
[www.smokeybear.com](http://www.smokeybear.com)



**Tree  
Talk Patterns**



## OBJECTIVES:

The student will be able to:

1. Exhibit an understanding that every plant and every animal has a unique place in nature.
2. Identify ways they can help protect or provide for things in nature.

## BACKGROUND:

Every plant and every animal has a unique place in nature. There are ways of appreciating plants and animals without taking them from their natural habitats. This helps to protect our environment. Some examples are planting trees, making birdhouses, planting flower gardens, making nestboxes for squirrels, and making bat boxes.

## VOCABULARY:

**habitat** - the place in nature where plants and animals live

## ADVANCE PREPARATION:

Cut a large leaf from bulletin board paper.

## PROCEDURE:

### *Setting the Stage*

Discuss with the class that every plant and every animal has a special place in nature. Talk about what happens when we catch an animal, bird, or insect in the woods and bring it home with us. Do we know how to take care of it, and can we provide what it needs to live?

### *Activities*

Read *The Salamander Room* by Ann Mazer. Discuss what the boy in the story discovered about caring for his salamander. Help students understand that plants and animals should be left in their own habitat. We can still appreciate animals and plants without taking them from their homes.

### *Follow-Up*

Ask students to think of ways that they can most likely or least likely help protect or provide for things in nature. (Make bird feeders, birdbaths, nestboxes for squirrels; plant trees; plant a flower garden; pick up litter.) Write or draw students' suggestions on a large leaf shape from bulletin board paper. Encourage them to choose a project to complete at home.

## EXTENSIONS:

1. Borrow or buy a real salamander for observation. Be sure to ask for care and feeding instructions. Have students help prepare a special tank with leaves, moss, and branches. After the project is completed, return the salamander to its home or natural habitat.
2. Have students create a salamander home using a large box, scissors, glue, and construction paper. Provide clay for the students to create 3-D salamanders.
3. Write salamander poems. They should each contain one fact about salamanders. Provide a reading center with books about salamanders.

## Grades:

K-2

## Subjects:

Science, Environmental Awareness, Literature

## Time Needed:

30 minutes

## Materials:

*The Salamander Room* by Ann Mazer  
one large leaf-shaped piece of paper  
bulletin board paper

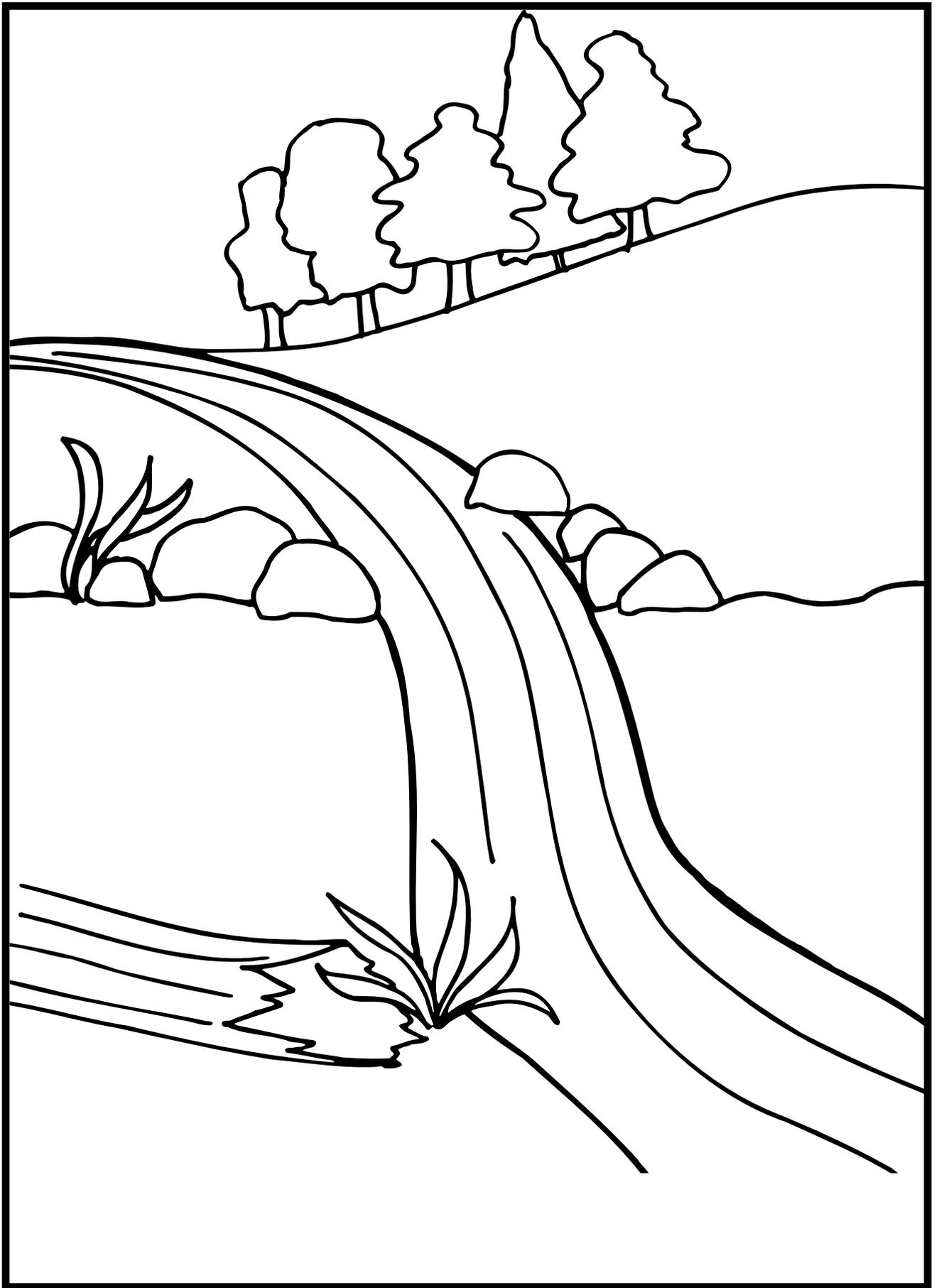
4. Show on a map where salamanders can and cannot be found.
5. Color the habitat coloring page and draw the salamanders where they might live.

**ORIGINAL DEVELOPMENT RESOURCES:**

Mayberry, S. (1994). *Linking science with literature*. Greensboro, NC: Carson-Dellosa.

Mazer, A. (1991). *The salamander room*. New York, NY: Alfred A. Knopf, Inc.

Spring, K. (1993, April/May). *The primary mailbox magazine*.



# Notes

## OBJECTIVES:

The student will be able to:

1. Recognize how the colors of different seasons hide insects and animals.
2. Define camouflage.
3. Identify several species of sea life that hide among their surroundings.
4. Display an understanding of how some sea animals protect themselves by blending in with their surroundings.
5. Predict what would happen if animals could not camouflage themselves.

## BACKGROUND:

Animals adapt to their environment in order to survive. Coloration patterns protect a species from predators by allowing it to blend with the plants and natural formations found in its habitat. When environmental conditions change, many animals can alter their color.

There are many different species of sea life that hide among their surroundings. By blending in, they avoid their enemies while sneaking up on their prey. Many of these animals use special patterns or colors. A few of these sea creatures are cuttlefish, shrimp, and octopus. Some fish even change colors and patterns to fit their surroundings.

## VOCABULARY:

**camouflage** - the means or result of disguising things to deceive an enemy

**environment** - the aggregate of surrounding things, conditions, or influences

**predator** - habitually preying upon other animals

**prey** - an animal hunted or seized for food

## ADVANCE PREPARATION:

1. Gather materials, including paper fish, and cut pieces of different patterns of wallpaper.
2. Place some small red toys on a piece of red construction paper against some red fabric in the storytime area.
3. Cut out chameleon patterns on tagboard for each student.

## PROCEDURE:

### *Setting the Stage I*

Have students notice the red objects. Place white objects against the red and let the children compare how easy or difficult they are to see. Use the word "camouflage" in the discussion. Read *Who's Hiding Here?* by Yoshi. Discuss what camouflage means. Discuss how all the illustrations in the story show pairs of animals except for the first and last illustration.

## Grades:

K-2

## Subjects:

Science, Art

## Time Needed:

40 - 50 minutes

## Materials:

*Who's Hiding Here?* by Yoshi

small red toys

red fabric

white objects

variety of colored construction paper

pictures of animals who use

camouflage

chameleon patterns

tagboard

water colors

brushes

*How to Hide an Octopus and Other*

*Sea Creatures* by Ruth Heller

eight-inch squares of wallpaper per

student

light blue construction paper per

student

small fish pattern per student

crayons

scissors

glue

### *Setting the Stage II*

Ask the class if they have ever played the game hide-and-seek. Discuss how many ocean animals' safety and supply of food depend on the ability to hide-and-seek. Explain that many of them use special patterns and colors to blend in with their surroundings, this way they can avoid their enemies.

### *Activities I*

Spread out different colors of construction paper on a table. Ask several students to select a color. Instruct them to look around the room and find a pair of objects the same, or nearly the same, color as the paper. Display the camouflage pairs. Also use printed fabrics and let the students try to find pairs of things they could hide on the material such as pieces of yarn, broken crayons, and chalk. Help the students see that the camouflage works because of the distraction of the pattern.

### *Activities II*

Read the book *How to Hide an Octopus and Other Sea Creatures* by Ruth Heller. Have the students name some of the sea animals in the story and name one way they hide. List these on the chalkboard or a chart.

### *Follow-Up I*

1. Discuss with the students how the colors of the seasons hide insects and animals.
2. Discuss and show pictures of some animals or insects that use camouflage. Discuss the chameleon whose color changes with its surroundings.
3. Distribute pre-cut chameleon patterns on white tagboard. Have students watercolor them green. Blend other colors over the green to show camouflage.

### *Follow-Up II*

1. Students will use their knowledge of ocean hide-and-seek by creating a fish that can hide in the environment.
2. Have each student glue an eight-inch square of wallpaper near the top of a 9" x 12" sheet of light blue construction paper.
3. Give each student a white construction paper copy of a fish pattern, and explain that the fish must live in this wallpaper environment that they have created. Tell them that before they glue their fish in its new home, they should decorate it in a way that would make it safe from its enemies.
4. Have the students share their fish with the class.

## **EXTENSIONS:**

1. Take a nature walk and carefully look to see any insects that might be hiding. Collect material that could be displayed as good camouflage materials. Display in a nature center. On the next day, hide some items from the classroom among the camouflage materials. Instruct students to find them.
2. Using butcher paper and crayons, create background scenery for a mural that includes flowers, plants, and trees. Select and draw outlines of animals from the story that could hide among the bright colors of the mural. Cut out and hide these animals on the mural.
3. Discuss what predators and prey are.
4. Play "Predators and Prey." This is a form of hide-and-seek. The student chosen to be the predator is blindfolded. He or she counts to 15 while everyone else hides. The students hiding must be able to see the predator at all times. After counting, the predator removes the blindfold and looks for "prey." The predator can turn around, squat, or stand on tiptoes but cannot change locations. The predator should see how many students he or she can find and identify out loud where they are. When identified, they have been "eaten." They then become predators. When the original predator cannot see any more students, all the predators now put on blindfolds. All remaining prey move in closer. Repeat the process if several students are hidden. Discuss what would have made it easier to be the last one caught. (From *Project WILD*)
5. Students can name their fish and write two facts about it at the bottom of the project.
6. Students can choose one of the sea creatures to learn more about. They can collect pictures or write a

report to share with the class.

7. Newspaper or magazine camouflage -- Using two identical pages, cut animal shapes from one of the sheets. Glue the shapes on the identical page in the same spot to hide or camouflage the animal. Have students count how many shapes they see. Raise the page to the light. Your students will be surprised what they see. Let them make their own camouflage pages.

### **GEOGRAPHY EXTENSION:**

Using a globe or flat map, have students point to where species of sea life would live or not live and tell why according to climate.

### **ORIGINAL DEVELOPMENT RESOURCES:**

Flagg, A. (1994, June/July). *The primary mailbox magazine*, pp. 3-5.

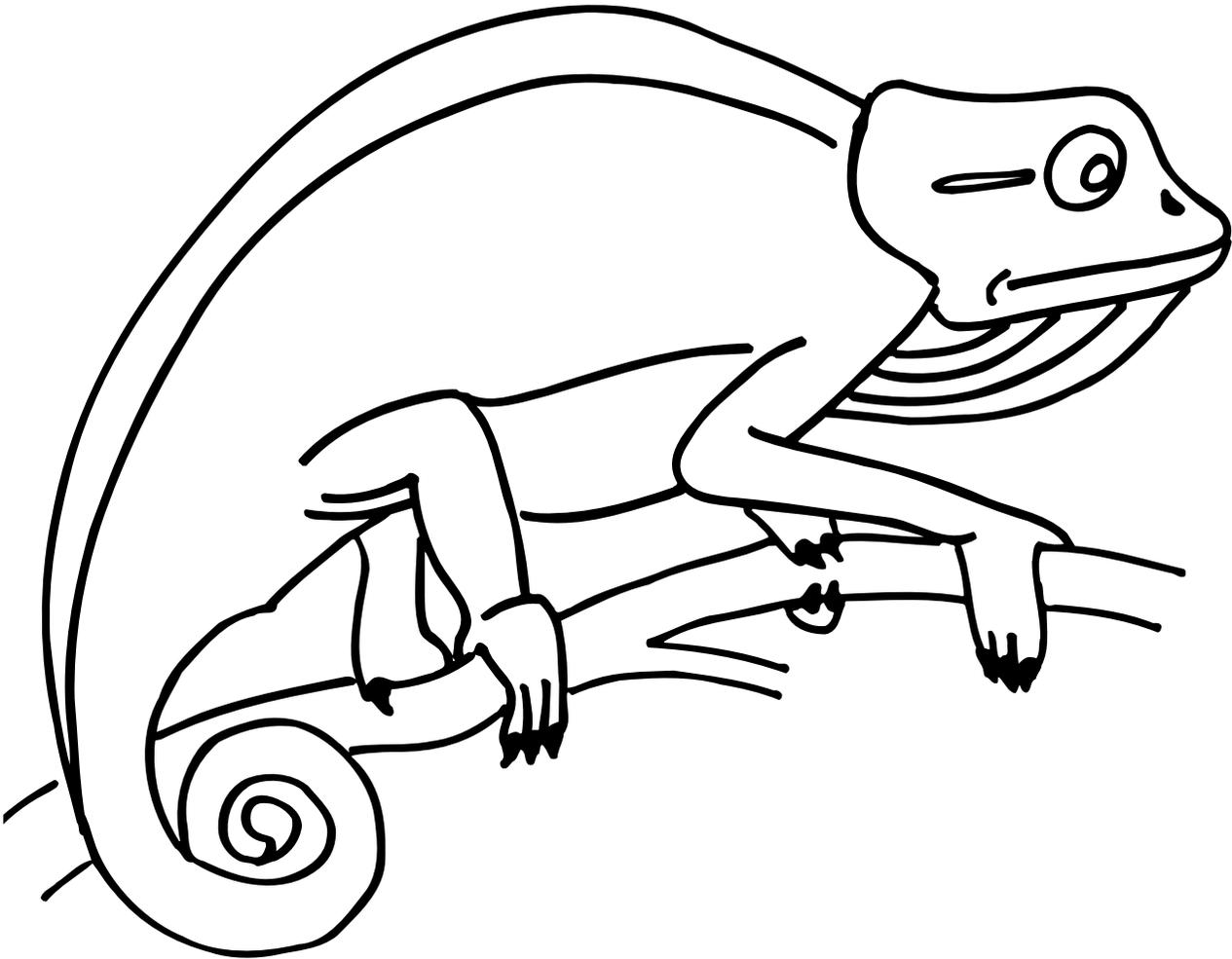
Heller, R. (1985). *How to hide an octopus and other sea creatures*. New York, NY: Grossett and Dunlap.

Raines, S.C. & Canady, R.J. (1989). *Story stretchers: Activities to expand children's favorite books*. Mt. Ranier, MD: Gryphon House.

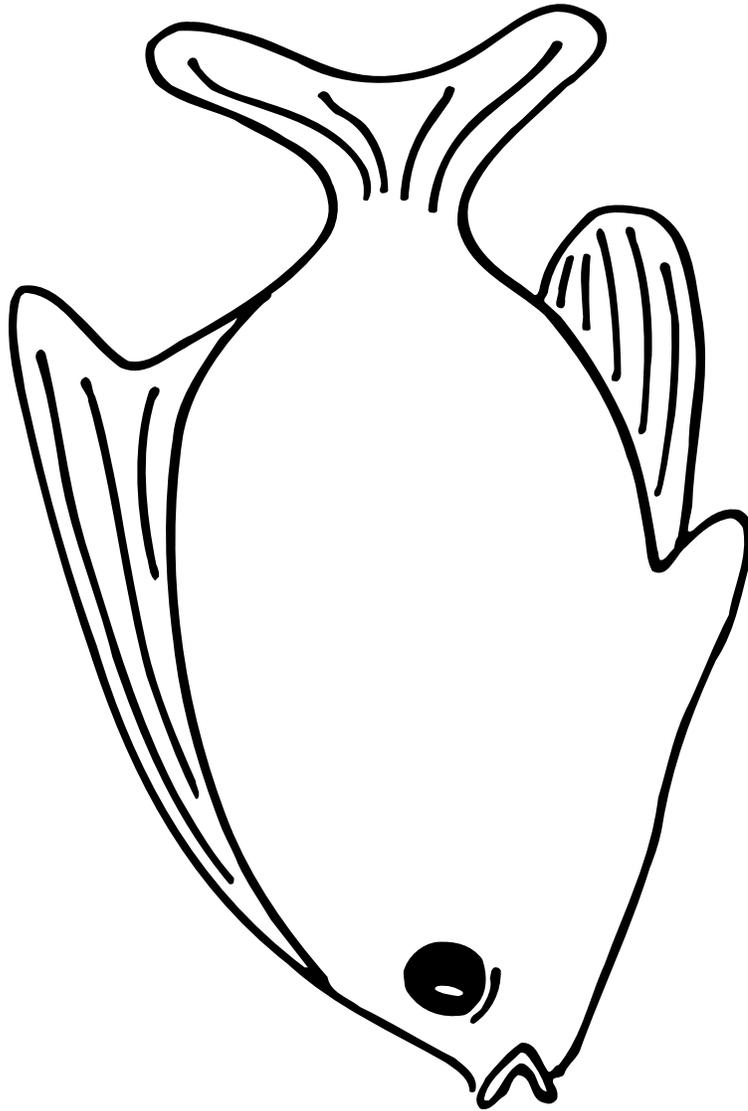
Western Regional Environmental Education Council. (1986). *Project WILD - Elementary activity guide*.

Yoshi. (1992). *Who's hiding here?* Englewood Cliffs, NJ: Simon & Schuster

# Camouflage the Chameleon



# Camouflage the Fish



# Notes

## OBJECTIVES:

The student will be able to:

1. Name several different facts about ladybugs.
2. Identify ways that ladybugs and some other insects are beneficial to the environment.

## BACKGROUND:

The ladybug is an interesting insect with some beneficial characteristics. The insect saves plants by eating aphids and other insects. The ladybug puts out bad smells for its protection. Its life-cycle is in four stages: (1) Clusters of eggs are laid on leaves. (2) Larva hatches from eggs. (3) The larva sheds its skin several times and then emerges as a pupa that will attach itself to a stem or leaf. (4) One week later, the new adult beetle emerges.

## VOCABULARY:

**aphid** - a small insect that sucks the juice of plants

**beneficial insect** - one that eats harmful insects (Examples: ladybugs and praying mantis.)

**larva** - the immature, wingless, feeding stage of an insect that undergoes complete metamorphosis

**metamorphosis** - a change in form, structure, or function as a result of development

**pupa** - an insect in the nonfeeding, usually immobile, transformation stage between the larva and the adult stage

## ADVANCE PREPARATION:

1. Gather materials.
2. Prepare chart or cards with clues for guessing game (optional).

## PROCEDURE:

### *Setting the Stage*

Play a guessing game with clues before introducing the topic of ladybugs. Use some of these clues: (a) I am thinking of a tiny insect, (b) The insect has six legs, (c) The insect has feelers to touch, taste, and smell, (d) The insect has two kinds of wings, (e) The insect helps plants by eating aphids, (f) The insect puts out bad smells for its protection, (g) The insect is red, (h) The insect has spots. Students can take turns guessing the insect. Older students can help read the clues from a chart or cards. When there is a correct guess, show a picture of a ladybug.

### *Activity*

Read the story *The Grouchy Ladybug* by Eric Carle. Have the students name the different animals the ladybug met and discuss how each one was larger than the other.

### *Follow-Up*

Discuss how the ladybug helped in some way, even though she was grouchy. Talk about what she eats and how it helps us. See how many other insects the class can name that help us in some way. Give clues if needed. (Another insect that eats harmful insects is a praying mantis. Bees and butterflies pollinate flowers that produce grains, fruit, and vegetables.)

## Grades:

K-2

## Subjects:

Science, Math, Literature

## Time Needed:

30 minutes

## Materials:

*The Grouchy Ladybug* by Eric Carle  
clues for guessing game  
picture of ladybug  
chart paper

## **EXTENSIONS:**

1. Discuss what helpful and harmful mean. Complete “Helpful or Harmful” worksheet.
2. Provide each student with a moveable clock face. Go back through the book *The Grouchy Ladybug* and talk about the clocks on each page that show the passage of time. Have students find the time on their clocks and tell what time it is.
3. Keep a class booklet of activities by the hour. If possible, cut the pages in the shape of ladybug. With a stamp pad and clock stamp, stamp a clock face on each page to draw in the time. Have different groups of students illustrate the book.
4. Draw the life cycle of a beetle.
5. Compare/Contrast insects using comparison charts.
6. Use with “Spring Surprise” in Learning Through Legacy (K-2).

## **ORIGINAL DEVELOPMENT RESOURCES:**

Carle, E. (1977). *The grouchy ladybug*. New York, NY: T. Y. Crowell Co.

Main, E. A. (1994, April/May). *The primary mailbox magazine*. p. 39.

Mayberry, S. C., Ed.D. (1994). *Linking science with literature*. Greensboro, NC: Carson-Dellosa.

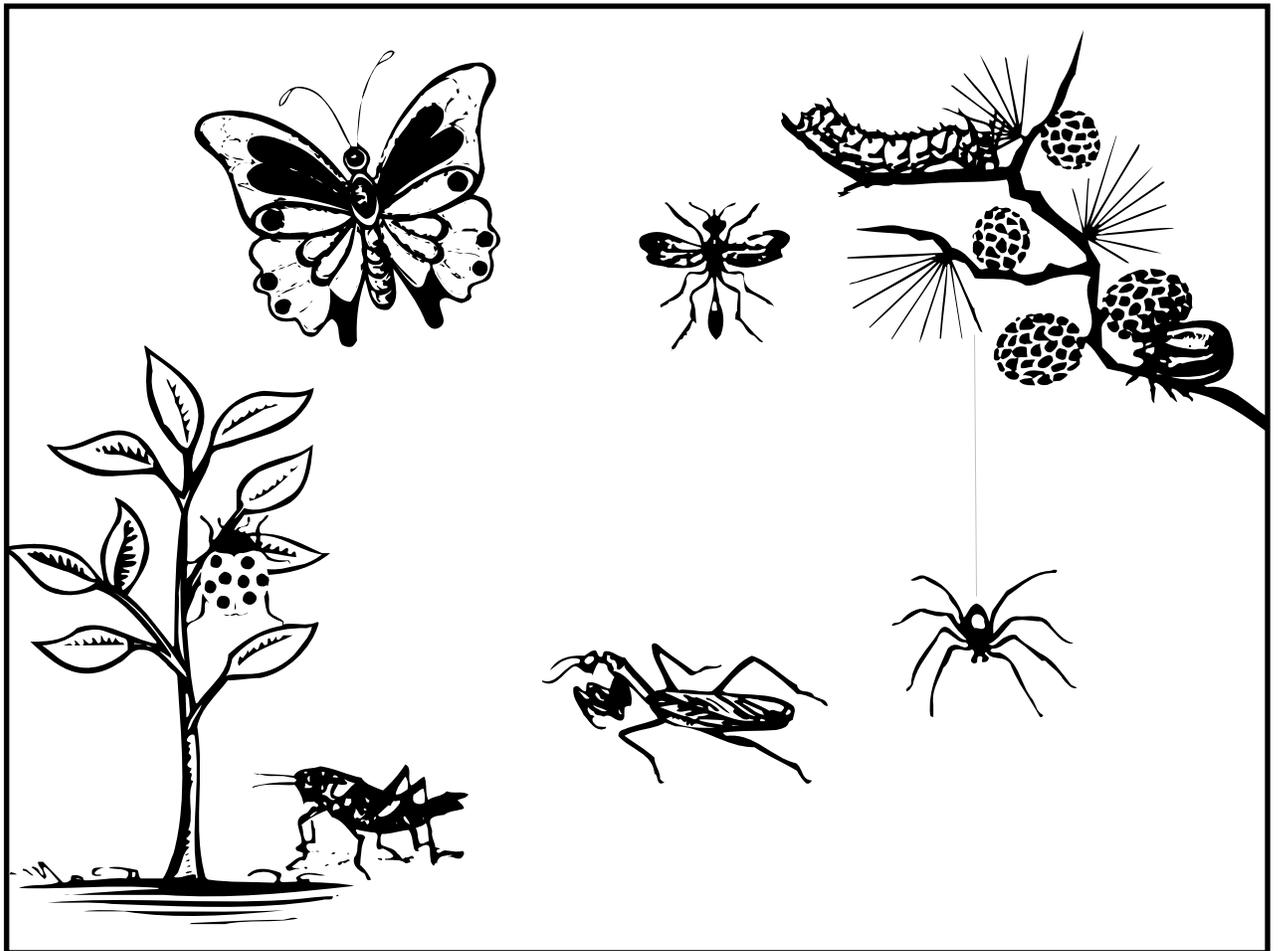
[www.marchbiological.com/L/ladybug.html](http://www.marchbiological.com/L/ladybug.html)

<http://berkeleyhort.com/ladybug.htm>

[www.geocities.com/Athens/Parthenon/5719/ladybug](http://www.geocities.com/Athens/Parthenon/5719/ladybug)

# A Plant's Friend? Helpful or Harmful?

Insects may be helpful or harmful to plants, people, and other animals. Some insects carry pollen which helps plants grow or eat other insects that may harm plants. Other insects may bite people or destroy plants. (Note: the spider is an arachnid not an insect.) Point out examples of insect relatives and how they are alike or different.



Draw a red X on the harmful insects. Color the insects that are helpful.

## Word Bank:

caterpillar

ladybug

tick

grasshopper

butterfly

spider

wasp

praying  
mantis

Brainwork: Is a spider helpful or harmful?



## OBJECTIVES:

The student will be able to:

1. Identify and label the four developmental stages of the butterfly.
2. Explain the usefulness of butterflies in the pollination process.

## BACKGROUND:

Butterflies have a unique life cycle. This lesson will illustrate the transformation of this insect's life. This transformation is known as metamorphosis. The four stages of metamorphosis are (1) egg, (2) caterpillar, (3) pupa, and (4) adult.

## VOCABULARY:

**metamorphosis** - a change in form, structure, or function as a result of development

**nectar** - the saccharin secretion of a plant, which attracts the insects or birds that pollinate the flower

**pollen** - the fertilizing element of flowering plants consisting of fine, powdery, yellowish grains or spores

**pupa** - an insect in the nonfeeding, usually immobile, transformation stage between the larva and the adult stage

## ADVANCE PREPARATION:

1. Gather required materials.
2. Prepare "Caterpillar Snacks" with sliced apples, pears, plums, strawberries, and oranges. Cut egg cartons so that two six-section strips result. Mix fruit yogurt and whipped topping.

## PROCEDURE:

### *Setting the Stage*

Read *The Very Hungry Caterpillar* by Eric Carle. Discuss the stages of a butterfly's life.

### *Activities*

1. Have students draw a picture to represent each stage on the "Spring Surprise" art sheet. They may use the life cycle sheet for reference and for labeling the stages.
2. Discuss how the butterfly helps spread the pollen when he feeds on the nectar in flowers. Also discuss how this helps plants to grow.
3. Predict what might happen if insects did not pollinate flowers.

### *Follow-Up*

Serve "Caterpillar Snacks": sliced apples, pears, oranges, plums, and strawberries. Use half of a styrofoam egg carton for every two students as a serving dish. Be sure to wash styrofoam egg cartons. Cut so that two six-section strips result. Each student places a small amount of fruit in each section. In another bowl, mix equal parts fruit yogurt and whipped topping. Spoon this into the space remaining in the sections and top it with raisin eyes and pretzel antennae. Spoon it out and eat it up!

## Grades:

K-2

## Subjects:

Science, Math, Language Arts

## Time Needed:

45 minutes

## Materials:

*The Very Hungry Caterpillar* by Eric Carle

"Spring Surprise Street" life cycle reference sheet

crayons

sliced fruit (apples, pears, plums, strawberries, oranges)

styrofoam egg cartons (one per student)

fruit yogurt

whipped topping

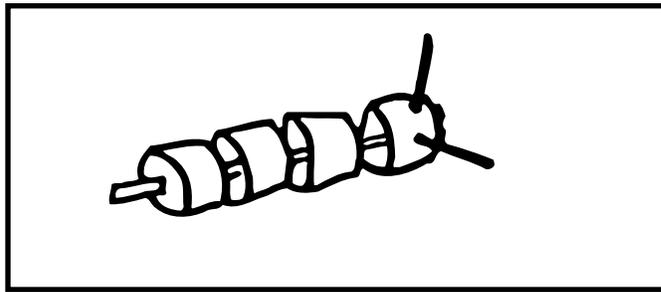
plastic spoons

raisins

pretzels

## EXTENSIONS:

1. Create a class graph with the topic, "Would you let a caterpillar crawl on your hand?". Have students trace their hands. Draw and cut out a caterpillar and glue on the hand for "yes." Place each student's cutout on the chart.
2. Observe caterpillars in a terrarium or natural habitat. Specimens for each life cycle can also be obtained from companies such as Carolina Biological Supply Company or Insect Lore.(See [www.carolina.com](http://www.carolina.com))
3. Make an egg carton caterpillar. Cut egg carton into sections of three. Paint the egg carton section with green tempera paint. After the paint has dried, glue a green cotton ball to the top of each section. (Color the cotton balls by shaking them in green powdered tempera paint.) Draw eyes or use gummed paper. Poke two holes in the caterpillar's head; attach a section of pipe cleaner to each hole.
4. Use "A Plant's Friend" in Learning Through Legacy (K-2).
5. Create a time line of how long it takes an egg to change to an adult butterfly.
6. Make a marshmallow caterpillar using large marshmallows/pretzels (see drawing below).



## ORIGINAL DEVELOPMENT RESOURCES:

Carle, E. (1979). *The very hungry caterpillar*. New York, NY: Collins Publishers.

Patten, L. & Kaplan, E. (1994, April/May). *The primary mailbox magazine*. p.35.

Raines, S.C. & Canady, R.J. (1989). *Story stretchers - Activities to expand children's favorite books*. Mt. Ranier, MD: Gryphon House.

Sterling, M.E. (1990). *Thematic unit - Creepy crawlers*. Teacher Created Materials, Inc.

<http://insected.arizona.edu>

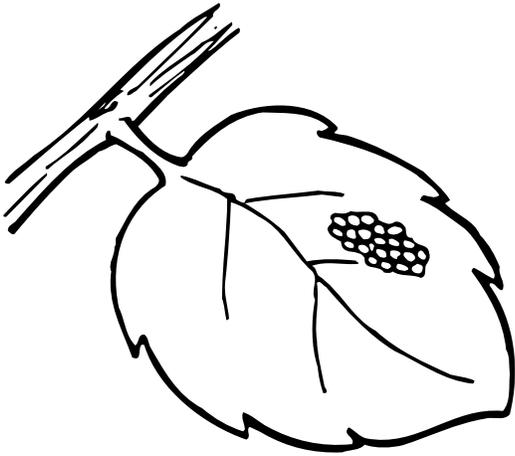
# Spring Surprise

Draw each stage.

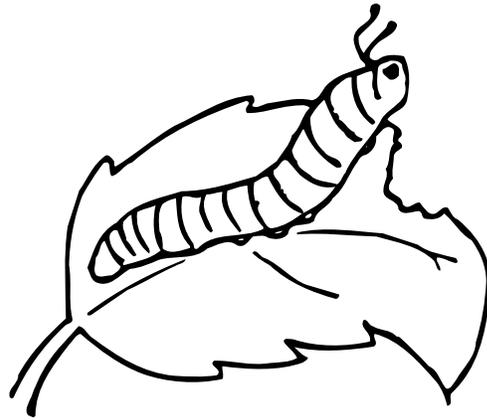
<p><b>Egg</b></p>	<p><b>Caterpillar</b></p>
<p><b>Pupa</b></p>	<p><b>Adult</b></p>

# The Life Cycle of a Butterfly

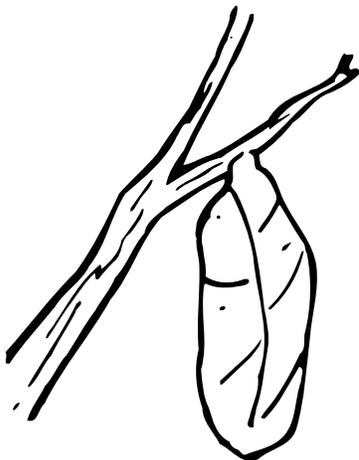
Color and cut out the butterfly life cycle patterns.



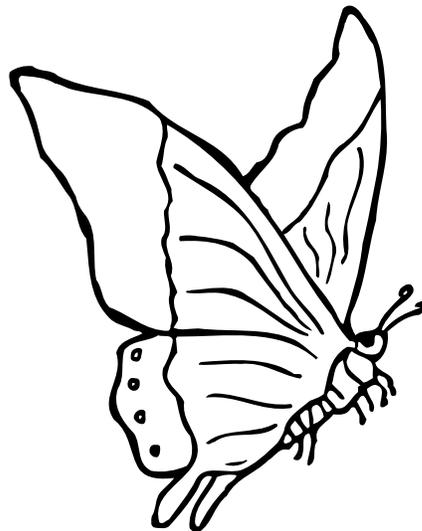
Butterfly lays eggs on the tips of leaves.



Caterpillar hatches and begins to eat and grow.



Pupa hangs from a silken pad.



Adult butterfly emerges from chrysalis.

## OBJECTIVES:

The student will be able to:

1. Identify three different habitats of birds.
2. Explain why birds build nests.
3. Identify materials used for building nests.
4. Explain how birds build nests.

## BACKGROUND:

Birds build nests of different sizes, shapes, and materials to house and protect their eggs. Most build their nests close to where they find their food. There are several bird habitats that include water, trees, and ground. Birds' feet and legs give a clue to where they live. Long legs usually wade in water, webbed feet swim, broad feet walk on ground, and curved feet perch on branches.

## VOCABULARY:

**nest** - a structure of twigs, grass, and mud formed by a bird as a place in which to lay and incubate its eggs and raise its young

## ADVANCE PREPARATION:

1. Cut out pictures of birds from magazines such as *Your Big Backyard*, *Ranger Rick*, *National Geographic*, *National and International Wildlife*. Make sure to have clear views of the birds' feet. Mount them on tagboard. Make simple drawings of three bird habitats: water, trees, and ground.
2. Have parents collect several abandoned bird nests and send to school in a container, or the teacher could collect them. Have children wear food handling gloves when working with the nests.
3. Write choral reading "Five Little Birds" on chart paper. (See follow-up activities.)

## PROCEDURE:

### *Setting the Stage*

1. As the children come to the circle, play tape of bird sounds to set the stage.
2. Look at the prepared pictures with the children to identify clues that will help them predict where a particular bird lives most of the time. Ask "How long do you think it takes a bird to build a nest?"

### *Activities*

1. Discuss how birds build nests of different sizes, shapes, and materials to house and protect their eggs.
2. Divide into pre-arranged groups. (Groups can have bird names with a picture of that bird in the group work area). Each work area will have an abandoned bird nest, magnifying glass, and recording sheet. The group will determine and record what materials the birds used to build the nests. The groups can share their findings with the class. A graphing activity, on which items were found the most, can also be done.
3. Make a timeline of how long it takes a bird to build a nest.
4. Discuss the time of year (month/season) birds build nests.

## Grades:

K-2

## Subjects:

Science, Math, Language Arts

## Time Needed:

40 minutes

## Materials:

bird pictures cut from magazines and mounted on tagboard  
several abandoned bird nests  
several magnifying glasses (optional)  
recording sheets  
bird sounds tape  
tape recorder  
chart with choral reading "Five Little Birds"

*Follow-Up*

Introduce choral reading “Five Little Birds” written on chart. Read as a choral reading.

Five baby birds sitting in a tree  
The first one said, “We will fly so free.”  
The second one said, “We will sing a song.”  
the third one said, “We eat all day long.”  
The fourth one said, “Where is our nest?”  
The fifth one said, “Let’s go home to rest.”  
Then “boom!” went the thunder, down came the rain  
And the five baby birds flew home again.

**EXTENSIONS:**

1. Make bird feeders or bird houses and hang them from trees in the school yard. Bird feeders can be made by spreading pine cones with peanut butter and rolling in bird seed.
2. Take a collecting walk for items with which to build nests. Give them shallow paper soup bowls and let them assemble their nests in them. Make “eggs” by rolling modeling clay or play dough in balls.

**ORIGINAL DEVELOPMENT RESOURCES:**

Greeko, M. (1993). *Birds, early years thematic notes*. Pala Verdes Estates, CA: Frank Schaffer Publications.

# Nest Sweet Nest

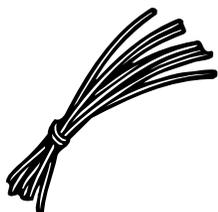
\_\_\_ grass



\_\_\_ mud



\_\_\_ straw



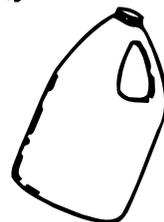
\_\_\_ feathers



\_\_\_ leaves



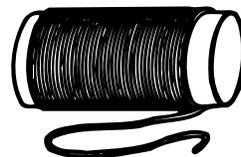
\_\_\_ plastic



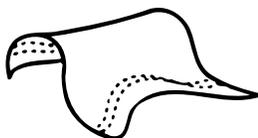
\_\_\_ twigs



\_\_\_ string



\_\_\_ cloth



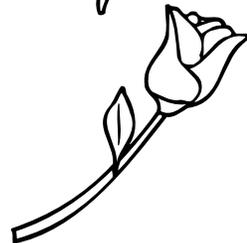
\_\_\_ weeds



\_\_\_ paper



\_\_\_ flower



# Notes

## OBJECTIVES:

The student will be able to:

1. Define habitat.
2. Identify the things that plants and animals need to survive.
3. Understand the concept of endangered and extinct animals.
4. Identify several endangered species.
5. Identify the main reasons species become endangered.

## BACKGROUND:

Since the year 1600, about 300 species of wildlife have become extinct either directly or indirectly as a result of human activities. In 1985, 254 plants and animals were listed as being endangered. In 2000 there were 1,244. Loss of habitat is the biggest cause. Other major causes of endangerment include change of habitat, illegal or unregulated use of the plant or animal, disruption of migration routes, pollution, and natural causes.

Within their habitat, plants and animals must find everything they need to live. All living things need food, water, space, and shelter as well as sunlight and air. Some species of animals are endangered because their habitat is disappearing or changing.

## VOCABULARY:

**endangered** - in danger of extinction

**extinct** - complete disappearance of a species

**habitat** - the place where plants and animals live

## ADVANCE PREPARATION:

1. Review the list of endangered plants and animals.
2. Write to or visit the website of the U.S. Department of the Interior ([www.doi.gov](http://www.doi.gov)) for a list on the national level.
3. Gather required materials.

## PROCEDURE:

### *Setting the Stage I*

Illustrate the meaning of endangered and extinct by playing the game “Going, Going, Gone.” Choose a helper and have the remaining students form a circle. Each student in the circle represents an imaginary animal group that can be named. The helper is a person. The helper goes around the circle tapping each student on the head repeating “going, going, gone.” Those tapped on “gone” leave the circle and sit out. When about one -quarter are left, stop and explain that the group is now endangered. Continue to play until one is left; then inform the students that their species is now extinct.

### *Setting the Stage II*

Ask each student to draw a picture of where he or she lives. Ask the students to include pictures in their drawing of the things they need to live where they do, for example, a place to cook food, a place to sleep. Discuss with students what they drew and have them point out the things they need to live. Show pictures of different types of animal habitats and discuss why different animals have different habitat requirements.

## Grades:

K-2

## Subjects:

Science, Social Studies, Art, Language Arts

## Time Needed:

30-45 minutes

## Materials:

pictures of endangered animals

endangered species lists

hard boiled egg

glass bowl

oil

red and blue food coloring

large sheets of paper for each group

crayons or markers

*Farewell to Shady Glade* by Bill Peet

drawing paper

pictures of different types of habitats

### *Activities I*

1. Discuss the main reasons animals and plants are endangered. Discuss and show pictures of some animals that are endangered.
2. Conduct this experiment to show how man has affected some animal habitats. Fill a small glass bowl half full of vegetable oil. Then create an “oil spill” by stirring in a generous amount of purple food coloring (made by mixing red and blue food coloring). To demonstrate the harmful effects of the “oil,” place a hard-boiled egg in the mixture. Spoon repeatedly the mixture over the egg; then let the egg float for thirty minutes. Next remove the egg and let it dry. Have students discuss or record their observations of the egg. Then peel the shell from the egg. Share additional observations. Help students understand that oils and other dangerous poisons can be life-threatening to the animal inside.

### *Activities II*

1. Show pictures of where some animals live.
2. Talk about the things every animal needs in its home. Talk about the idea that home is bigger than a house. In some ways, it’s like a neighborhood. For animals, that neighborhood where all survival needs are met, is a habitat.
3. Tell the students that some animals are in trouble because their habitat is being changed.
4. Read *Farewell to Shady Glade* by Bill Peet and discuss that the animals in the story needed to survive.

### *Follow-Up I*

While the “oil spill” experiment is proceeding, divide the class into groups. Challenge each group to create a mural that features three or more endangered animals. Provide the students with pictures of different endangered animals.

### *Follow-Up II*

Divide the class into groups. Provide each group with a large piece of white paper and crayons or markers. Have the students talk about and then illustrate suggestions to help animals in trouble. Have each group share its ideas with the class.

## **EXTENSIONS:**

1. Have students research animals in the area that are endangered and explore reasons they are endangered.
2. Have each student choose an endangered animal to study, and make a shoe box diorama to illustrate what was learned. Have each make a suitable habitat for the animal.
3. Prepare a word search puzzle for the class using Alabama Endangered Species.
4. Have each student make an endangered animal picture dictionary.
5. Go outside and look for animal homes. Be sure not to bother the animals in the home. (See *Life Under a Log*, Learning Through (K-2))
6. Draw animal homes. Compare them to places where people live.
7. Take a colored ball of yarn. Each student is labeled food, water, shelter, and space. Connect the food, water, shelter, and space by having each one take hold of part of one long string of yarn. The students all connected represent a suitable arrangement of food, water, shelter, and space to meet an animal’s needs.
8. Geography Connections: (1) Show on an Alabama map where some of the endangered species live. (2) Make a timeline of the disappearance of species.

## **ORIGINAL DEVELOPMENT RESOURCES:**

- Christensen, C. (1992, April/May). *The primary mailbox magazine*, pp.3-4.
- Peet, B. (1992). *Farewell to shady glade*. Boston, MA: Houghton Mifflin.
- Western Regional Environmental Education Council. (1986). *Project WILD - elementary activity guide*.
- U.S. Fish and Wildlife Service, (1999). *Threatened and endangered species of Alabama: A guide to assist with forestry activities*.
- [http://ecos.fws.gov/tess\\_public/pub/stateListingAndOccurrenceIndividual.jsp?state=AL](http://ecos.fws.gov/tess_public/pub/stateListingAndOccurrenceIndividual.jsp?state=AL)

## OBJECTIVES:

The student will be able to:

1. Observe the animals living under a log or rock.
2. Identify several different species of animals.
3. Classify the animals according to size, shape, color, and number of legs.

## BACKGROUND:

There is a whole community living underneath large rocks, dead leaves, or logs that are lying on the ground. These special habitats are perfect for many species of animals that thrive in dark, damp places. These animals might be discovered under a log or rock: centipedes or millipedes, cockroaches, earthworms, slugs, sowbugs, pillbugs, ants, and termites.

## VOCABULARY:

**habitat** - the place where plants and animals live

## ADVANCE PREPARATION:

Place several logs or pieces of board in a shaded area of the school yard or in a landscaped area with protected shrubs, or identify previously naturally fallen logs or branches. Leave for several weeks before starting activity. Make sure the logs are not in an area cut by mowers.

## PROCEDURE:

### *Setting the Stage*

Tell the students that they are going to visit a community that nobody has visited before. It is a secret place right in the school yard. Show pictures of some different animals they might see, and discuss the different characteristics of these community members.

### *Activities*

1. Take the students to the area where the logs are placed. Ask them if they can see a place where animals live. Explain that we will see a place where animals live. Explain that we have to be polite visitors and try not to disturb the animals more than necessary.
2. Turn the logs over and put the students in groups around the logs. A few students at a time can observe the logs and collect specimens. (Some specimens will move quickly into burrows.) Others can study the area where the logs had been. Show students how to move specimens gently to the box top for studying. (Caution - Students should not touch the specimens with their hands. Be sure to use brushes or long tweezers for this.)
3. Explain that this area under the log is the animals' habitat or home. This is just the right place for these animals to live.
4. Notice how different animals move.
5. Notice how the area is cool and damp. Observe what plants live around the area.

### *Follow-Up*

Try to determine how many different kinds of animals live under the logs. Group them by number of legs, size, shape, and color. Provide a reference check for any identification or questions. (*The Hidden World - Life Under a Rock* by Lawrence Pringle is suggested.) Return animals carefully after study.

## Grades:

K-2

## Subjects:

Science, Math, Social Studies

## Time Needed:

45 minutes

## Materials:

logs, boards, or rocks  
cardboard box for studying specimens  
magnifying glasses  
paper for recording and classifying  
brushes or tweezers

## **EXTENSIONS:**

1. Draw pictures and try to identify some of the animals seen.
2. Make a class graph of the animals that were the most often identified.
3. Repeat this activity using a bush as a habitat. Classify the specimens. Note how the animals on a bush are different from animal life under a log.

## **ORIGINAL DEVELOPMENT RESOURCES**

Nickelsburg, J. (1976). *Nature activities for early childhood*. Menlo Park, CA: Addison-Wesley.

Pringle, L. (1977). *The hidden world - Life under a rock*. New York, NY: Macmillan Publishing Co.

Richards, R. (1990). *An early start to nature*. Englewood Cliffs, NJ: Simon and Schuster.

<http://insected.arizona.edu/lessons.htm>

## OBJECTIVES:

The student will be able to:

1. Define what a pond is.
2. Identify some of the plant and animal life that can live in or near a pond.
3. Explain why many species can't live outside of their habitat.

## BACKGROUND:

A pond is a small body of water, either natural or made by people. Many animals depend on the pond for survival. Animals live around, on, and under the water. Many water birds, such as ducks, make their homes on ponds. Insects live in or around the water. Frogs, toads, and salamanders lay their eggs under water and crayfish settle along the bottom. A pond also contains an underwater forest. Plants cover most of the pond's bottom. The plants provide oxygen, food, and shelter for aquatic animals.

## VOCABULARY:

**aquatic** - growing or living in or upon water

**habitat** - the area or environment in which an organism normally lives

**pond** - a small body of still water, either made by people or natural.

## ADVANCE PREPARATION:

Gather some pictures of insects, plants, and animals that might be in and around a pond.

## PROCEDURE:

### *Setting the Stage*

Question the students to determine what they know about ponds and what plants and animals live in and around ponds. Point out the pictures gathered of some of these species. Talk about three different pond habitats: around the water, in the water, and on the pond's bottom.

### *Activities*

1. Make a chart with the class, listing plants and animals in each habitat. Discuss why they must live in their particular habitat.
2. Pond Food Chain  
This activity will have students look at various food chains. It will help students understand that if one part of the food chain is affected, it can drastically affect the other animals of the food chain.
  - The pond is an ecosystem that shows all animals are interdependent upon each other.
  - Give each student a copy of the pond animals. Students color the animals. Read the names of the animals and plants together, then have students cut out the different animals.
  - The children put the animal squares together in the form of a pyramid beginning with the following sequence:
    - a. sunlight
    - b. plankton
    - c. tadpoles, insects, wrigglers and fish

## Grades:

K-2

## Subjects:

Science

## Time Needed:

45 minutes

## Materials:

pictures of species of plants and animals that live in and around ponds  
chart paper  
markers  
*Fish is Fish* by Leo Lionni  
cut and paste worksheets for each student  
scissors  
glue

- d. frogs, turtles, and larger fish
- e. snakes, raccoons, and birds
- Give the students time to form the food chain pyramid. Then use the pyramid as a springboard for discussion.
- Ask:
  - a .Does your food chain begin on land or in the pond?
  - b. How do you know?
  - c. What would happen to your food chain if the plankton all died off?
  - d. What happens when animals' food becomes scarce?

### 3. Pond Animals

- Give cooperative groups a decorated lunch bag. Tell the groups that they are each responsible for a specific part of the pond life. The students must write the appropriate title on their lunch snack.
- Children do research to find animals and plants that belong under their assigned title.
- The children must find pictures or draw plants and animals that fit under their headings.
- Hang the bags onto a bulletin board or designated area. Encourage a discussion about the plants and animals chosen.
- Graph the results and discuss.
  - The titles are: insects, fish, and plants
  - They include: water strider, diving beetles, whirligigs, dragonflies, mosquitoes, carp, sunfish, minnows, shiner, bass, trout, skunk cabbage, sedges, rushes, reeds, lily pads.

### *Follow-Up*

1. Read *Fish is Fish* by Leo Lioni. Talk about how different characters in the story were made to live in a certain habitat. Talk about what would happen if the fish tried to live on land.
2. On the attached cut-and-paste worksheet, determine where each square will fit best. (Answers: frog on the leaf, fish in pondwater, insect in the air, and turtle beside the cattails.) Talk about directions. Use a compass rose as you decide which animal is in the N, S, E, or W.

### **EXTENSIONS:**

1. Take a field trip to a pond. Carefully bring back pond creatures and plants to make a homemade pond or aquarium. (Instructions are attached.) Be sure to return these safely to their habitat when the study is complete.
2. Prepare a pond life scavenger hunt to complete on a field trip.
3. Sing the song "Little Tadpole" to the tune of Are You Sleeping?

Little tadpole, little tadpole  
 Lost his tail, lost his tail  
 Now he has two feet  
 Now he has two feet  
 Look, a frog! Look, a frog!

This can be copied and used as a handwriting lesson.

### 4. Read the Turtle Poem: The Little Turtle

There was a little turtle,  
 He lived in a box,  
 He swam in a puddle,  
 He climbed on the rocks

He snapped at a mosquito,

He snapped at a flea,  
He snapped at a minnow,  
He snapped at me.

He caught the mosquito,  
He caught the flea,  
He caught the minnow,  
But he didn't catch me.

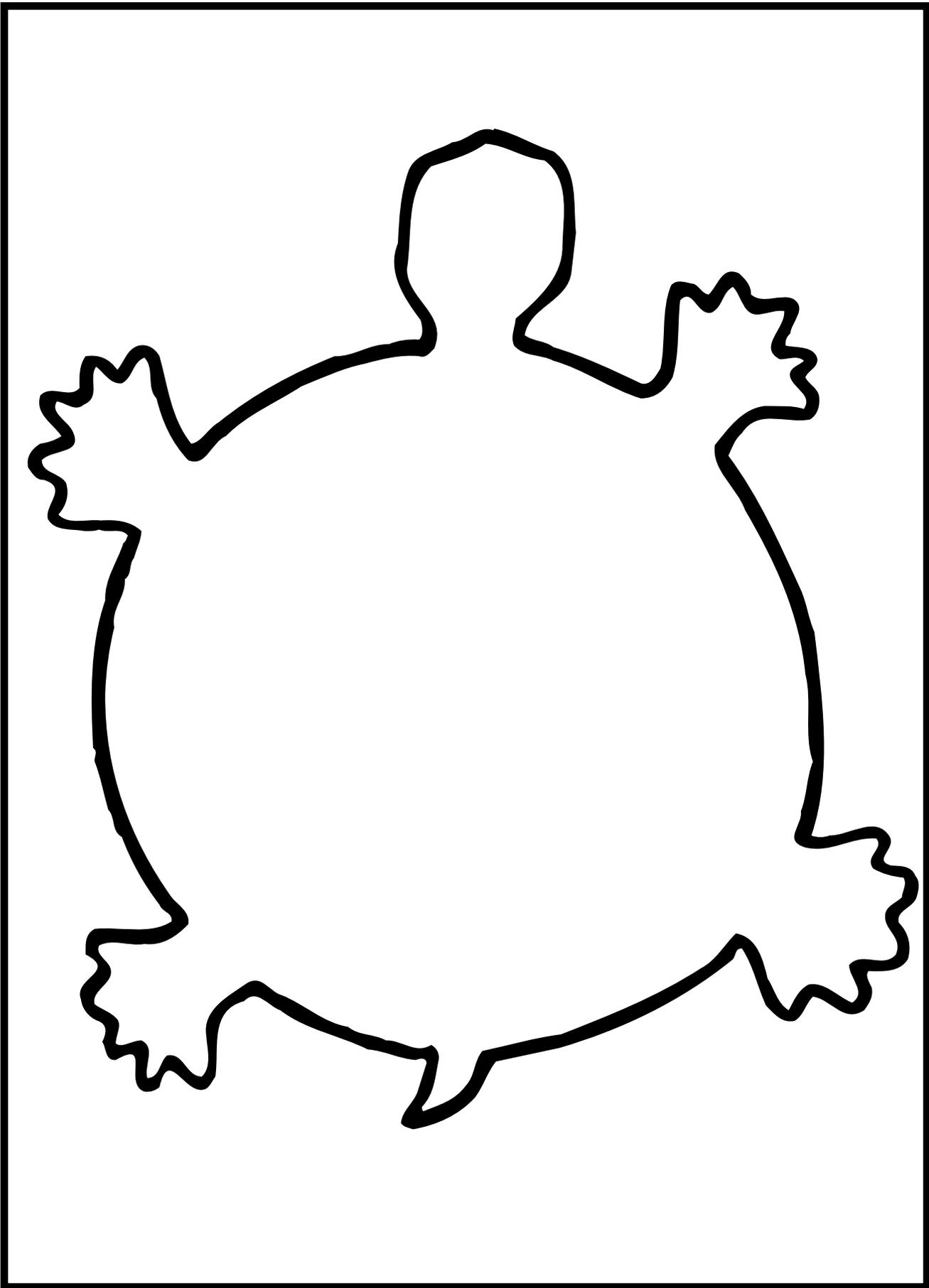
5. Art activity: Glue a green plastic bowl onto the turtle bottom pattern on the following page. Copy the poem above and glue it onto the top of the bowl. Children recite the poem while reading their turtle.

### **ORIGINAL DEVELOPMENT RESOURCES:**

Lioni, L. (1970). *Fish is fish*. New York, NY: Scholastic, Inc.

Nordjman, N. (1991). *The living pond*. Ossining, NY: Young Discovery Library.

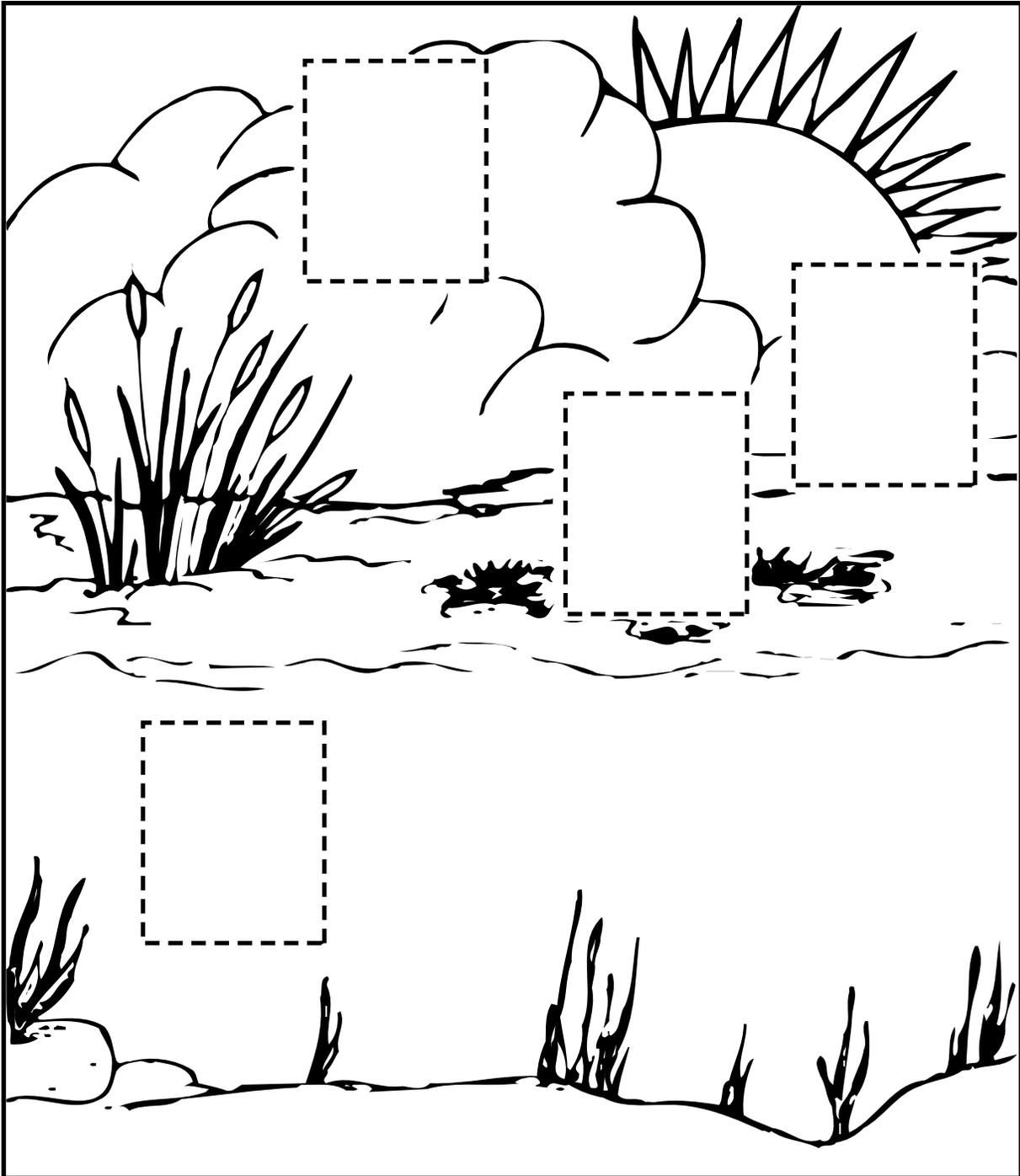
Webster, D. (1990). *Exploring nature around the year - Spring*. Englewood Cliffs, NJ: Julian Messner.

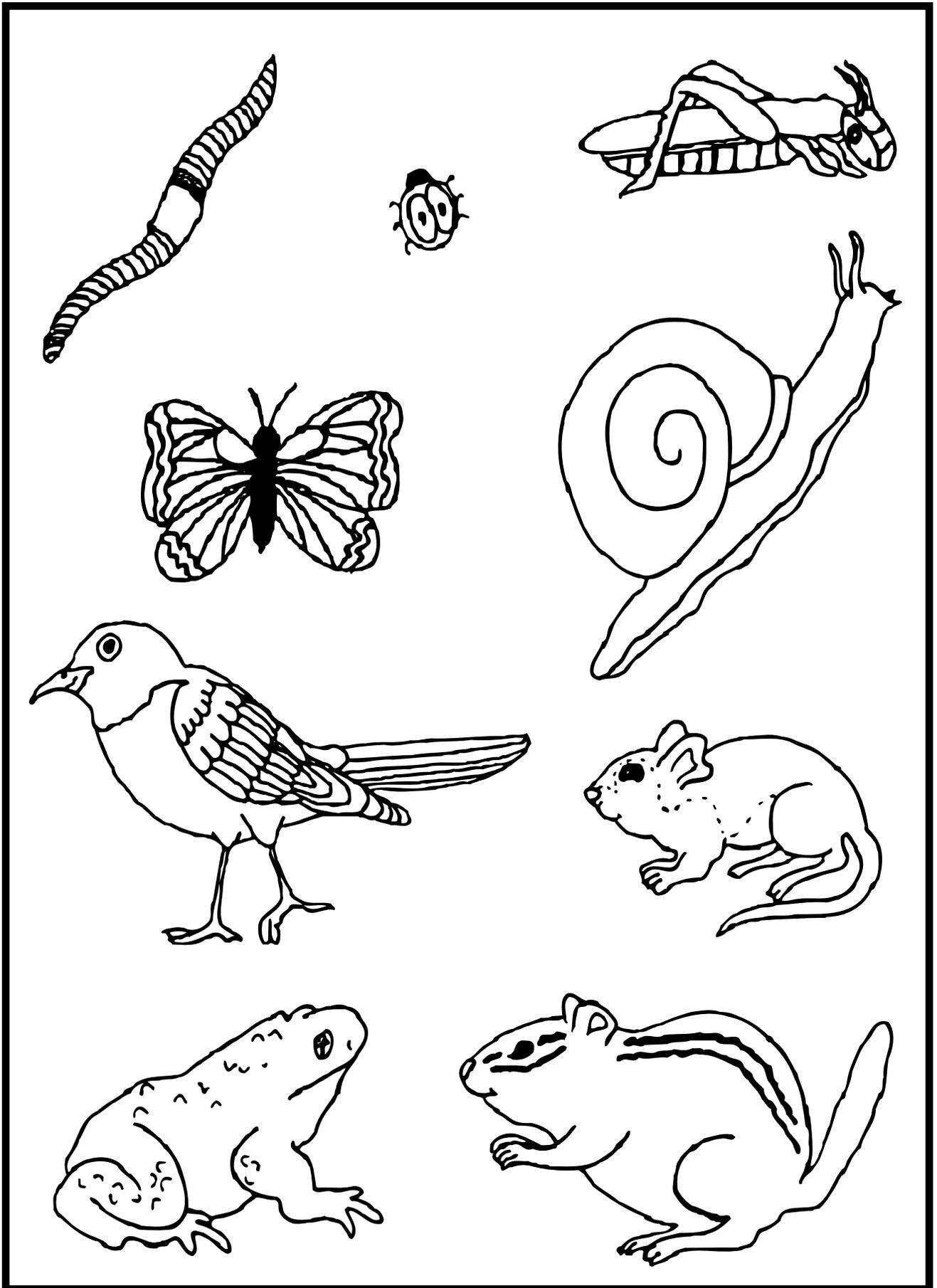


# MAKE A POND

You can make a pond for water animals in a plastic wading pool. This should be placed in the shade or on an open porch.

1. Cover the bottom of the pool with clean gravel.
2. Place a few large rocks in the pool to serve as hiding places and resting spots for animals.
3. Fill the pond about halfway with water from a hose or buckets. Let the water sit for a few days to allow any harmful chemicals to escape into the air.
4. Some water plants will make the homemade pond look more real. Dig up a few small plants from the shallow water.
5. Catch pond creatures with a dip net or a kitchen strainer attached to a pole. Many pond animals are almost too small to see. Sort through a net full of leaves or muck from the pond bottom. Look for tiny insects or water fleas. For carrying home, use a plastic container with a top. Keep larger animals in the pool for only a few days. Then let them go free where you found them.





# Notes

## OBJECTIVES:

The student will be able to:

1. Investigate the concept of habitat by building a worm farm.
2. Observe earthworms in their habitat.
3. Identify earthworms' importance in the environment.

## BACKGROUND:

Worms are a very important part of the food chain. They serve as food for birds and some reptiles and can be used as bait by Alabama fishers. Worms aerate the soil, which keeps the soil loose around the roots of the plants. They also help break down materials in the soil into simpler materials so that plants can use them. The worm habitat can be artificially created in the classroom to allow students a closer look at an animal that is vitally important to the environment.

## VOCABULARY:

**aerate** - to cause air to circulate through

**habitat** - the place where plants and animals live

**homebuilder** - someone who builds houses

## ADVANCE PREPARATION:

Obtain a large mayonnaise jar and lid per child for this project. Parents could save these. Punch several holes in the lid with a hammer and nail.

## PROCEDURE:

### *Setting the Stage*

Ask the children what kinds of houses they live in. Ask if they can tell about any other kinds of homes, for example, tree houses, dog houses, bird houses, caves, and snail shells.

### *Activity 1*

1. Read the book *A House for Me* by Mary Ann Heberman.
2. Discuss the various houses and what other houses some animals might use.
3. Ask what might affect the kind of home an animal chooses. For example, snakes have no legs or hands, birds can fly, bears need a safe place to sleep for winter.
4. Ask what someone is called who builds houses? (a homebuilder or carpenter)  
What tools and supplies are needed to build a house? (wood, nails, bricks)
5. Tell students they will build a home for earthworms called a worm farm. Ask what supplies they think they will need.

To build a worm farm:

- Place a layer of gravel in the bottom of the mayonnaise jar.
- Add potting soil until the jar is 3/4 full.
- Punch several air holes in the jar lid using the hammer and nail. (The teacher can do this ahead of time.)
- Add four or five earthworms dug from the school yard or purchased from a bait shop.
- Keep the soil moist but not wet. (Caution! -- Too much water is a sure way to kill worms!)
- Feed the worms small amounts of crushed dry dog food or cornmeal - about 1/2 teaspoon. (Worms can

## Grades:

K-2

## Subjects:

Science, Music, Language Arts

## Time Needed:

60 minutes

## Materials:

worms and worm food

crushed dog food or cornmeal

mayonnaise jars and lids for each

student

potting soil

gravel

water

construction paper

marbles

tempera paint

hammer and nails

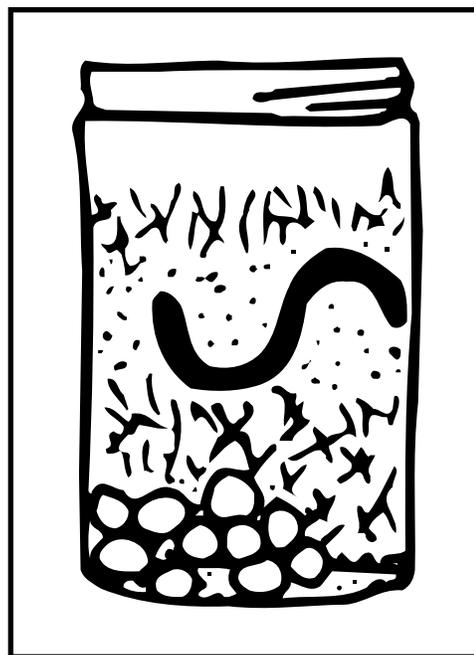
record "Walter the Waltzing Worm"

*A House for Me* by Mary Ann

Haberman

also be fed nonfat food scraps that would be suitable for composting.)

- Make a cover for the worm farm. Paint “worm tracks” on construction paper by rolling a marble in tempera paint and then rolling the marble across construction paper. Tape the paper cover around the worm farm to keep it dark.
- Pull the covers off quickly to observe the worms. Replace covers between observations.



#### *Activity 2*

**Worms Have a Mystery Habitat.** Have the children guess what is in your jar. Explain the care of the worms. Let the students dig into your container for worms. Allow the children to rinse off the worms. Guide the students as they make observations. Look for features of the worm (eyes, nose, mouth) . Watch and observe the movements of the worm. Count the rings on the worms (segments). Look at the variation in the segments of the worm. Which end is the top? Which is the bottom? Place barriers to block the worms’ path. Observe reactions. Compare segments size. Measure the worms and compare lengths. Use two different types of worms (red worms/night crawlers). Observe the burrows. Watch the sand and soil for mixing by the worms.

#### *Activity 3*

**Worm Cake.** This will put the icing on the cake for our worm activities. Put cupcakes in a line as you might observe a worm crawling. Put icing in between each cupcake to fill in the gaps. Ice the whole cake. Be sure and show the segments between each cake. Use coconut at each segment to stimulate the “setae” or bristles of the worm. You may want to show the pharynx and castings of the worm as well. Upon completion, using the overhead, discuss where on the worm cake the different body parts would be located. Discuss why the bristles are important for anchoring the worm in the ground when a predator comes along. Why do we need worms? What purpose do they play in our ecology? Why does the soil need to be aerated?

#### *Activity 4*

**Worm Model.** It’s time to make a worm model. Using toilet and paper towel rolls, construction paper, tape, staples, glue, and scissors, you can make your own worm for dissection. Simply cut a paper tube down the middle long ways as shown on the completed model. Using the worm diagram on the overhead, or at your table, make worm parts and glue inside the paper tube. (Remember that a worm has five hearts.) Cover with one layer of paper so that it looks like the skin of the worm. Use a different color of paper to make the saddle or clitellum. For dissection, simply find the open seam of the tube with your fingers and cut the paper along the seam. This will simulate cutting the layer of skin away from worm’s body. Fold the flaps back on the tube and you will be able to observe the worm’s parts as though it were a real worm. Make it as simple or as complex as your grade level may need.

#### *Activity 5*

**Worm Tracks.** Worms can make tracks on soft soil and sand. You can make worm tracks of your own. Simply put a large marble in a cup of paint. Roll the marble around in the paint and coat it very well. Take out the marble. Put the marble on the paper in the box. Tilt the box back and forth. Watch your worm tracks form before your very eyes. Make all the tracks you want on your paper. Save the worm tracks for when you make a worm habitat. Cut it to fit the outside of your habitat. Tape it on. When you are ready to observe your worms take it off quickly. Worms may not have eyes, but they do not like the light. It dries out their slimy skin. Be kind. Replace the paper as soon as you finish. Don’t leave them in the light too long. Have fun. Make some worm tracks today.

### *Activity 6*

**Worm Diagram.** Using the worm diagram on the overhead, take a piece of poster or tag board and make a worm diagram to use with your classroom. Use this as an opportunity to make a really nice poster for your students to use when you are discussing worms in your classrooms. Students can use your diagram to create their own diagram at their desks.

### *Activity 7*

**Worm Observations.** Using the magnifiers provided, observe worms as they move and react. Watch the pharynx as it moves in and out of the mouth. Find the saddle, otherwise known as the clitellum. Use the worm diagram on the overhead to locate the different body parts. Pile up a small mound of soil. Watch as the worm tunnels into the soil. It aerates the soil as it burrows down into the soil. Using the paper provided, journal the worm's movements and habits. Draw your worm. Share what you observe with your team members.

### *Activity 8*

**Tunnel of Worms.** You are hereby commissioned to enter the "Tunnel of Worms". On this fact-finding mission you will have 30 seconds to retrieve worm information. Be careful. If you choose correctly, you will be considered one of many worms that have escaped their infamous predators. Beware of moles, birds, frogs, and fish. They will send you back to home base as another worm statistic; eaten, before your life span was complete. If you pass through the "Tunnel of Worms" unscathed, you may consider yourself as one of the million of worms per acre that survive each day.

Directions:

- Choose a member of your worm team to count to 30 as each member enters the tunnel one at a time. The counter may also initiate a rainstorm at any time as you leave the tunnel.
- You have 30 seconds to enter the tunnel, find your worm fact, and leave before the rainstorm begins. Remember, if your tunnel is flooded you can be drowned.
- Each worm team member should open the envelope as soon as he leaves the tunnel. Share your worm fact with your worm team.
- If your card has the word bird, mole, fish, or frog on it you have encountered a predator and your time is over. You become the counter and rainmaker and the counter becomes a member of the worm team.
- Continue playing until all worm facts have been read aloud.

If you cannot read your worm fact, your teacher or friend may help you read it.

### *Activity 9*

**The Incredible Edible Worm Habitat.** Wash hands or use sanitizer before you begin. Simply take a cup and crush cookies of your choice into the cup. Put in a few edible ingredients to represent the soil your worm might live in, such as roots, decaying leaves, etc. Explain to your team what you are doing. After you have prepared your tasty soil, don't forget to add your gummi worm and bury him down inside the soil. You don't want a bird or frog to find him. You also do not want him to stay in the light too long. Don't forget the moles that can find the worm underground. After you have created your incredible edible worm habitat, explain to your team why worms are important for plants. How do worms "eat"? What are castings? What does it mean to aerate the soil? If you are hungry, you may want to eat your worm habitat. Bon-Apetit!

### *Follow-Up*

After observation, discuss how worms benefit the environment. Determine what the students learned from the exercise by comparing the type of things needed to build their home with the ones needed to build a home for worms.

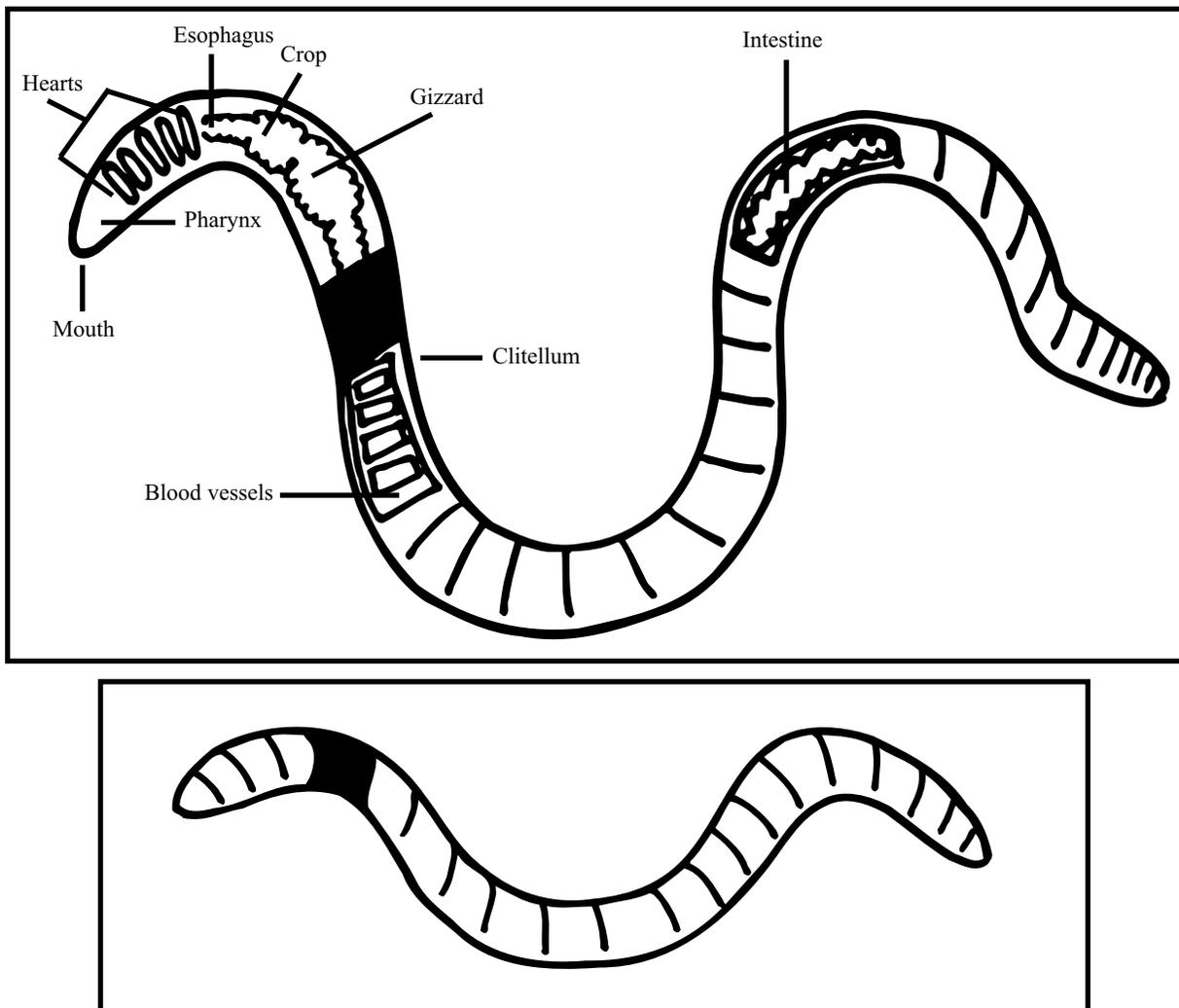
## EXTENSIONS:

1. Play the record, "Walter the Waltzing Worm." (See Resources.) Have students imitate the worm's movement.
2. Develop an experience chart with the class about building worm farms and the habitat needs of the worms.
3. Complete "Whose Home Is This?" worksheet to identify animal habitats.

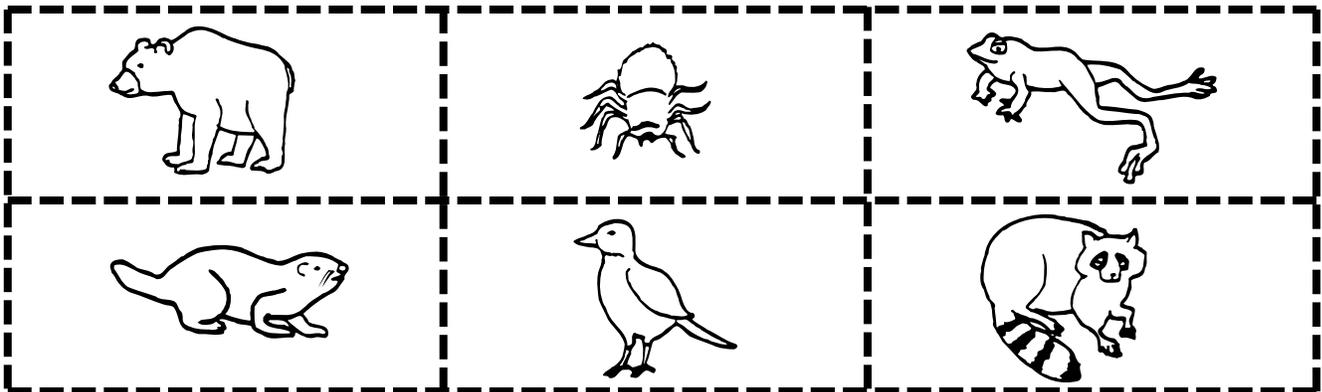
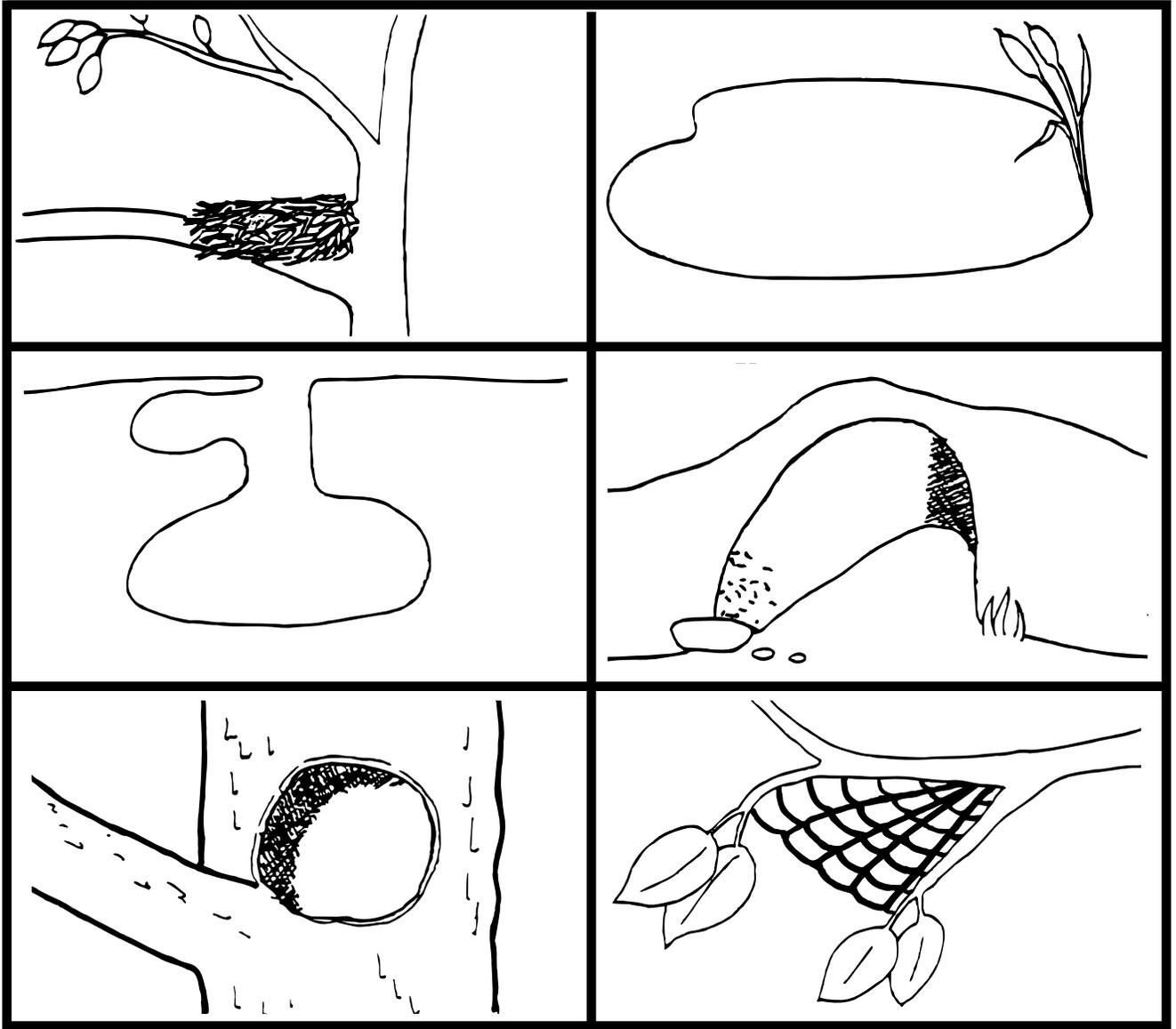
## ORIGINAL DEVELOPMENT RESOURCES:

Haberman, M.A. (1978). *A house is a house for me*. New York, NY: Viking Press.

Palmer, H. (1982). *Walter the waltzing worm*. Freeport, NY: Activity Records, Inc. Educational Activities, Inc.



# Whose Home Is This



# Notes

## OBJECTIVES:

The student will be able to:

1. Name several different facts about bats.
2. Identify two ways bats are beneficial to the environment.

## BACKGROUND:

Bats are found all over the world. There are several species that live in Alabama, some of which are endangered. About 40 percent of American bats are on the endangered species list. Bats are vulnerable to extinction because they give birth to only one baby per year.

Bats are an important part of our ecosystem. Most feed on insects, while others eat fruit and nectar. One little brown bat can eat 600 mosquitoes in just one hour. Fruit-eating bats help pollinate flowers and disperse tree seeds.

Bats sleep hanging upside down in out of the way places during the day and come out at dusk to hunt for food. Bats use sound waves (echolocation) to locate objects in the dark.

## VOCABULARY:

**echolocation** - the process of locating objects with sound waves

**endangered** - in danger of extinction

**extinct** - complete disappearance of a species

**fact** - something known to be true

**opinion** - what someone thinks or feels about something

**roosts** - groups bats live in

## ADVANCE PREPARATION:

1. Gather materials.
2. Hang up pictures of bats.
3. Reproduce bat patterns on white paper.

## PROCEDURE:

### *Setting the Stage*

Survey the students' attitudes about bats. Find out how many students fear bats, have seen bats, or heard stories about bats. Tally these on a board. Stress that people should never touch wild bats because some can have rabies which will make them sick. Have some pictures of bats displayed.

- Discuss in depth the concept of echolocation (the way bats navigate and catch their prey).
- Discuss the diverse habitats of bats. Ex: caves, barns, attics, treetops, hollow logs, and even underground.

### *Activities*

#### Activity 1

1. Draw three large bat shapes onto poster board and turn them into puzzles. Make each bat a different color. (light brown, dark brown, and black)
2. Children get into cooperative groups by their color and assemble puzzles. The group studies their bat facts,

## Grades:

K-2

## Subjects:

Science

## Time Needed:

50 minutes

## Materials:

patterns for little brown bat  
string or fishing line  
fact and opinion worksheets  
scissors  
sandwich bag for each student  
photographs of bats  
bat costume  
black, light brown, or dark brown  
posterboard

approximately 20 min, and then teach the rest of the class what they have learned.

3. After the group lesson allow for questions and answers.
4. Display the puzzles and their related facts for children to examine and review.

### Activity 2

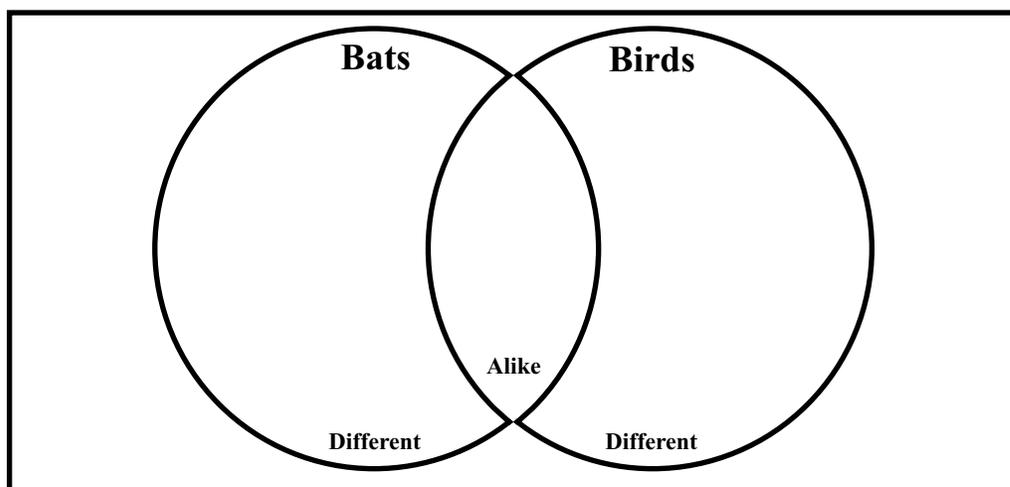
#### Bat Parts

Assemble a bat costume for one child to wear and display. Then ask questions about various bat parts. Allow students to come up to the front of the class and share their answers while they identify the correct bat body part.

#### Follow-Up

Review facts that the students learned by doing a fact-and-opinion activity. Discuss what “fact” and “opinion” mean. Provide each student with a worksheet, scissors, and a plastic sandwich bag. Have students cut out the statements and sort by “fact” and “opinion.” Have a partner assigned to check answers. Store in the sandwich bag when finished.

### EXTENSIONS:



1. Complete the Compare - Contrast Venn Diagram.
2. Read the story *Stellaluna* by Janell Cannon.
3. For a fun creative writing project, write and illustrate “Bat Tales” about bats who come into our homes to visit. Use the bat book pattern.
4. Play a bat and sound game. Talk about echolocation and how bats use sound waves, echoes, and their large ears in order to catch insects. Have students form a large circle in an open area. Blindfold one student (the bat) and lead to the center of the circle. Appoint several students to be moths and ask them to step inside the circle. The remaining students, who are spaced evenly, are trees. To play, the bat and moths carefully move around inside the circle. The bat repeatedly calls out “moth” and the moths in loud voices repeatedly answer “moth.” The object of the game is for the bat to listen carefully and tag as many moths as possible within an allotted amount of time. When a moth is tagged, he becomes a tree. If a bat wanders too close to a tree, the tree whispers “tree! tree!” and carefully helps steer the bat back on course. Play as many rounds as desired.

Questions to ask:

- a. Why must the bat call out?
- b. Why must the moths respond each time the bat calls out?

### ORIGINAL DEVELOPMENT RESOURCES:

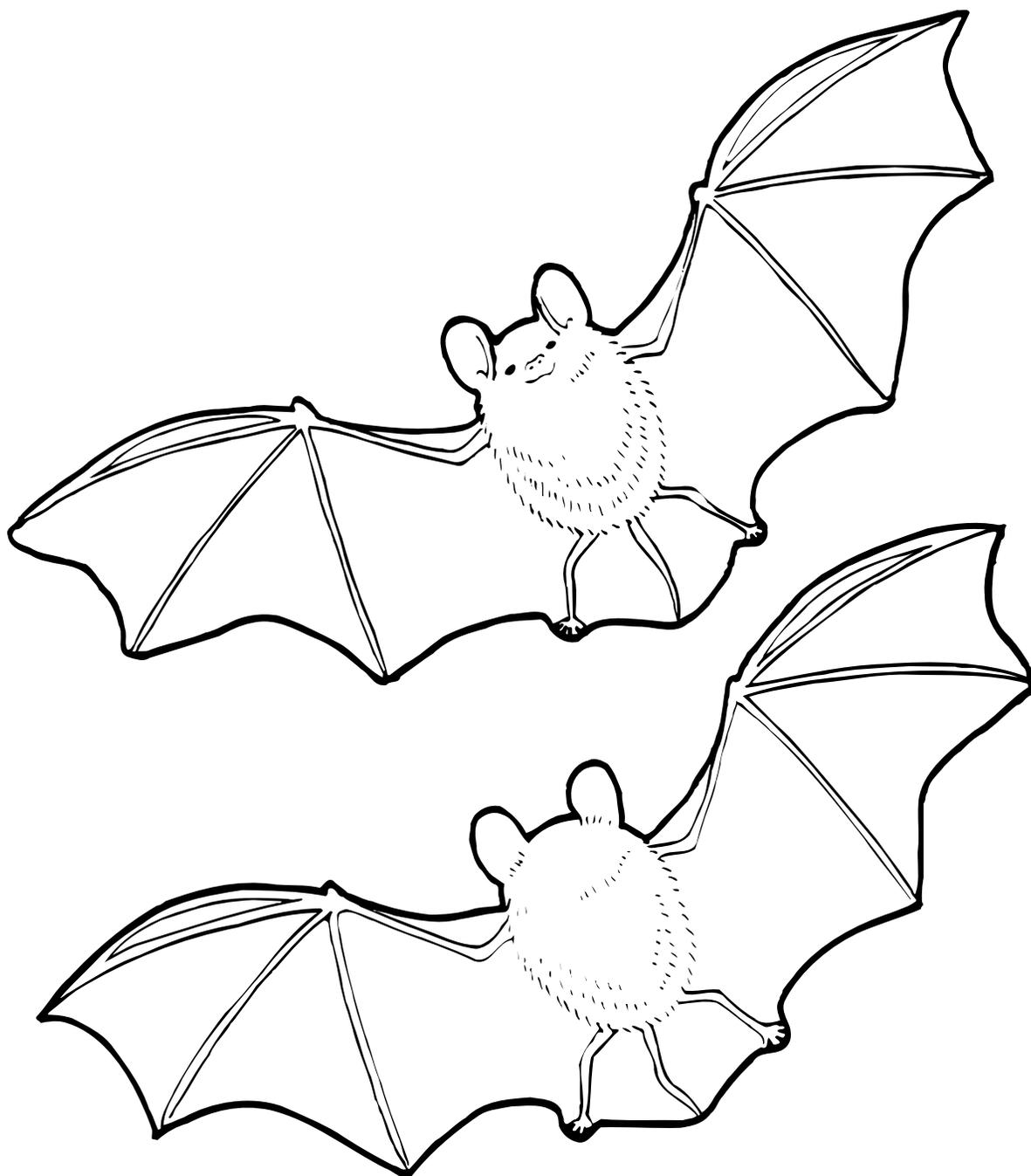
Cannon, J. (1993). *Stellaluna*. Orlando, FL: Harcourt, Brace, Jovanovich.

# Batty Statement

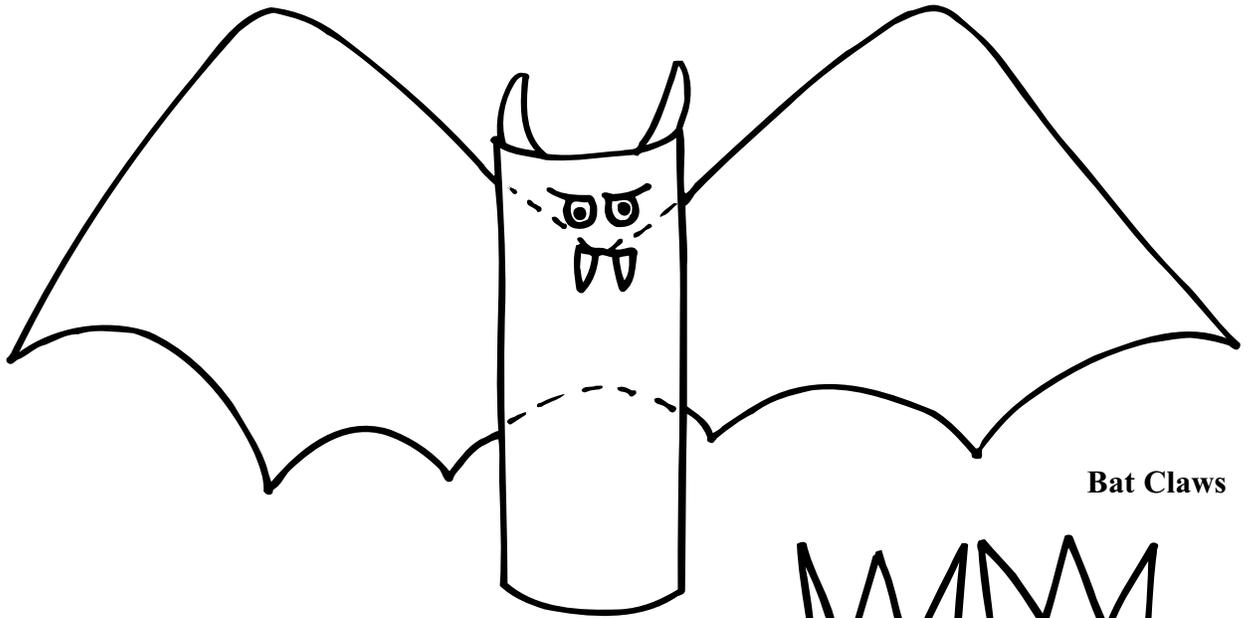
Read each bat statement. Decide if it is fact or opinion. Divide into two piles - "Fact" or "Opinion".

<b>1. Seeing a bat is a lucky sign.</b>	<b>9. Bats only have one baby per year.</b>
<b>2. Bats hang upside down to sleep.</b>	<b>10. Most bats eat insects.</b>
<b>3. Some bats eat fruit.</b>	<b>11. Bats usually live in groups called roosts</b>
<b>4. Bats are more interesting than spiders.</b>	<b>12. Bats look funny hanging upside down.</b>
<b>5. Bats hunt for food at night.</b>	<b>13. Bats are important to our environment.</b>
<b>6. A bat would make a fun pet.</b>	<b>14. Bats should live far away from people.</b>
<b>7. Bats are ugly.</b>	<b>15. Bats caves are spooky.</b>
<b>8. Bats are helpful to farmers.</b>	<b>16. All bats do not look alike.</b>

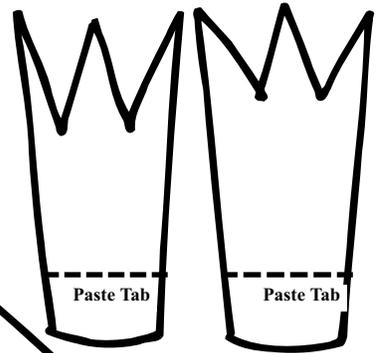
# Little Brown Bat



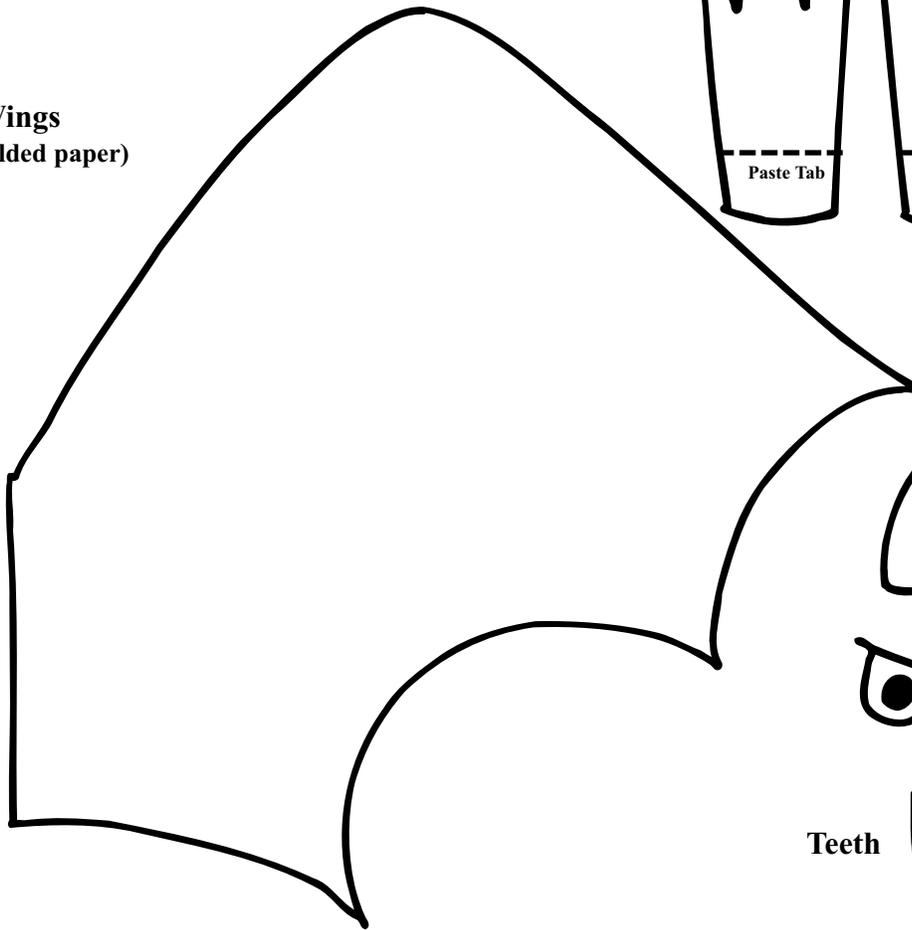
# Monster Bat



Bat Claws

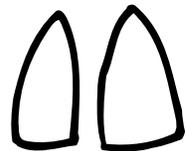


Bat Wings  
(Use folded paper)



Fold

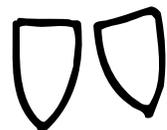
Ears



Eyes



Teeth



# Notes

## OBJECTIVES:

The student will be able to:

1. Locate the Gulf of Mexico.
2. Name some of the ocean life in or near the Gulf.

## BACKGROUND:

The Gulf of Mexico is an extension of the Atlantic Ocean into North America that has a 3,000 mile coast. The state of Alabama has 53 miles of this coast as its southern border. The Gulf is a major source of food, recreation, and natural gas. Commercial fishers catch red snapper, flounder, shrimp, mullet, oysters, and crabs. Some of the other sea life found in the Gulf are starfish, sand dollars, jellyfish, sea horses, and sea urchins. Look for these animals in a book about shells, fish, or seashore.

## VOCABULARY:

**ecosystem** - a system dealing with the interrelationships of organisms living in one environment.

**gulf** - a body of water that is an extension of an ocean or sea

## ADVANCE PREPARATION:

1. Gather materials.
2. Prepare a touch lab with samples of sea life, shells, and simple books about sea life.
3. Hang up a map showing the Gulf of Mexico.

## PROCEDURE:

### *Setting the Stage*

Explain that we are going to study a group of animals that live in a special ecosystem of our world. Give the students a sheet of white paper. Say, "As I draw on the chalkboard, you draw the same thing."

Draw a large fish on your paper. Add an eye and a mouth. Add two fins. Fill in the tail fin. Add scales all over the body. Now, where would you find this animal? If we called this fish a flounder, a red snapper, or a shark, where would it be found? Explain that we are going to study sea life that live in or near the Gulf of Mexico. Have a student locate the Gulf of Mexico on a map and mark it with a sticker. Talk about how the creatures that live in it need saltwater to live, not fresh water that is found in rivers, streams and ponds.

### *Activities*

See if the students can name some sea life that could be found in or near the Gulf. Have the class inspect and talk about the sea life and shells that are on display.

### *Follow-Up*

Provide a touch lab worksheet and some simple books to identify some of the sea life in the center. The worksheet would be made by the teacher with clues about sea life in the center. An example would be: find and name an animal that has two claws, fins, five arms, and a tube that squirts ink. Students can identify some of the sea life or just enjoy looking and touching the samples in groups with the teacher supervising.

## Grades:

K-2

## Subjects:

Social Studies, Science

## Time Needed:

45 minutes

## Materials:

large map showing the Gulf of Mexico  
samples of sea life and shells (some can be purchased at a seafood market or grocery store)  
simple shell and fish or seashore books  
white paper per student  
crayons  
colored sticker  
touch lab worksheet per student  
copies of sea animal memory games

## **EXTENSIONS:**

1. Place sea animal memory game in a learning center to be used during the students' free time. (See attached sheet.) Make two copies of each. Students turn over cards and try to find a match.
2. Have the students add to their original sea creatures' drawing by adding some blue water and other creatures that live in the sea.
3. Copy this poem for a handwriting and choral reading activity or use as a finger play. Students can illustrate this also.

Underneath the water  
Way down deep  
In sand, shells and seaweed  
Starfish creep  
Snails inch slowly  
Oysters sleep  
Underneath the water  
Way down deep.

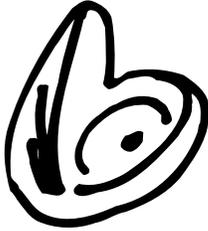
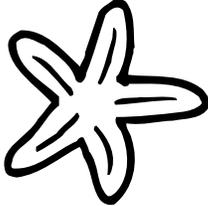
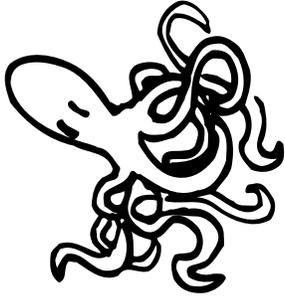
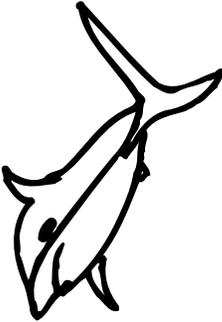
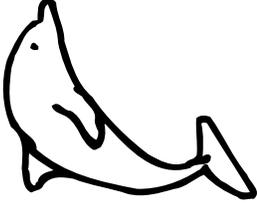
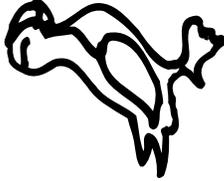
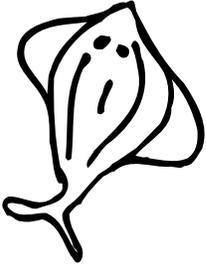
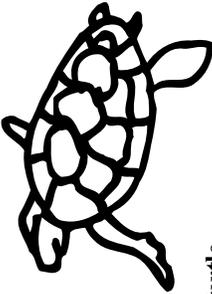
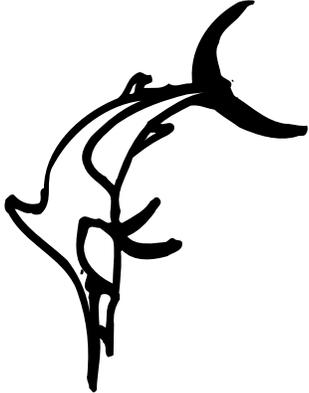
4. Refer to the "Life in the Gulf" and "Captain Bob and His Friends" in Learning Through Legacy (K-2).

## **ORIGINAL DEVELOPMENT RESOURCES:**

*Compton's interactive encyclopedia.* (1993/1994). Compton's New Media, Inc.

*Whole language environmental education manual - Oceans and the environment.* Sixth Annual Science and Environmental Education Conference EEAA.

# Sea Animal Memory Cards

			
Oyster	Pelican	Starfish	Octopus
			
Shark	Shrimp	Whale	Manatee
			
Crab	Porpoise	Puffin	Stingray
			
Hammerhead Shark	Sea Horse	Sea Turtle	Marlin

# Notes

## OBJECTIVES:

The student will be able to:

1. Identify things seen while visiting the beach.
2. Describe several species of ocean life in or near the Gulf of Mexico.

## BACKGROUND:

The Gulf of Mexico is an extension of the Atlantic Ocean into North America that has a 3,000 mile coast. The state of Alabama has 53 miles of this coast as its southern border. The Gulf is a major source of food, recreation, and natural gas. Commercial fishermen catch red snapper, flounder, shrimp, mullet, oysters, and crabs. Other sea life found in the Gulf are starfish, sand dollars, jellyfish, sea horses, and sea urchins. Fact cards are provided at the end of this lesson. These provide general information on each of these species.

## VOCABULARY:

**crab** - a sea animal that has a hard shell and paddle-shaped legs to help it swim

**starfish** - a star-shaped sea animal that lives in or on the sand of the ocean floor

**jellyfish** - simple animals made of jelly-like tissue that float on the ocean surface

**sand dollar** - a round hard sea animal that lives in the sand of the ocean floor

**sea horse** - a tiny fish whose head looks like a tiny horse

**sea urchin** - a sea animal that is covered with prickly spines

## ADVANCE PREPARATION:

1. Gather materials.
2. Prepare a display of sea life and shells.
3. Prepare fact cards.
4. Prepare materials for art projects.
5. Enlist adult or older student volunteers to help with art projects.

## PROCEDURE:

### *Setting the Stage*

Read *The Seashore Book* by Charlotte Zolotow. Have students discuss what they would see if they visited the beach.

### *Activities*

Share samples of sea life and shells with the students. Explain that they will be moving to several learning centers in the room and learning about some of the different sea life that live in the Gulf of Mexico. Explain that in each center there are fact cards to read about each sea animal and materials and instructions to make each sea animal. If possible, have an adult volunteer or older student in each center to help. Six different sea animals are studied and projects made.

## Grades:

K-2

## Subjects:

Science, Art

## Time Needed:

two one-hour periods

## Materials:

*The Seashore Book* by Charlotte Zolotow

samples of sea life and shells

sea animal fact cards for art projects

materials for art projects (parents are usually happy to donate some of these)

scissors

glue

crayons or markers

### *Follow-Up*

Divide the students in groups and send them to each center where they will find out facts about sea animals and then prepare art projects on these: sea urchin, jellyfish, sand dollar, crab, starfish, and sea horse. Instructions and patterns are included at the end of this lesson. Display the work from the ceiling and windows or on a wall.

### **EXTENSIONS:**

1. Have the students write stories on “What would you see at the beach?” with an emphasis on animals. A good idea would be to display these stories on a bulletin board with a beach towel as a background. Another title suggestion is “An Adventure at the Beach.”
2. For a beach effect, add a beach chair, umbrella, and sand toys to a reading corner where there are ocean books.
3. Create an ocean mural to display the sea animal on a bulletin board.
4. See “Exploring the Gulf” and “Captain Bob and His Friends” in Learning Through Legacy (K-2).

### **ORIGINAL DEVELOPMENT RESOURCES:**

*Compton's interactive encyclopedia 2000.* Compton's New Media, Inc.

*Whole language environmental education manual - Oceans and the environment.* Sixth Annual Science and Environmental Education Conference EEAA.

Zolotow, C. (1992). *The seashore book.* New York, NY: Harper Collins Publishers.

# Jellyfish

**Materials:**

one plastic grocery bag (clear), one twist tie, Easter grass

**Instructions:**

Place a small amount of clear Easter grass in plastic grocery bag. Close the end with the twist tie, near the stuffing. Shape the head so that it is round. Shred the rest of the bag to form tentacles.

# Spiny Sea Urchin

**Materials:**

one large marshmallow, toothpicks

**Instructions:**

Create a model of the sea urchin by sticking toothpicks into a marshmallow. Cover all sides using the toothpick “spines.”

# Sand Dollar

**Materials:**

one small white paper plate, glue, gold glitter, or sand

**Instructions:**

Using a pencil, trace a large pattern of sand dollar on the paper plate. Trace it with glue and sprinkle with gold glitter or sand.

# Sea Animal Fact Cards

## Sand Dollar Facts

1. A sand dollar is a round sea animal that lives in the sand of the ocean floor.
2. The sand dollar has holes on both sides of its body. It sticks its feet through these holes to move.
3. It is covered with tiny hairs.
4. When a sand dollar dies, it sometimes washes up out of the water, and its skeleton is found on the beach.

## Crab Facts

1. Crabs have two paddle-shaped legs to help them swim.
2. Crabs have eyes on short stalks.
3. They have a set of pincers used for holding and eating food and for defense.
4. They eat mostly meat and fish.
5. Some types of crabs are blue crab, fiddler crab, and ghost crab.

## Seahorse Facts

1. A seahorse is really a tiny fish. Its head looks like a tiny horse. Its body is long and bony with a tail that can hook on to objects.
2. A seahorse has no teeth; it sucks in tiny bits of food that float by.
3. Big fish like to eat seahorses, so they hide in seaweed. Some seahorses can change color.
4. The mother seahorse lays about 200 eggs, which the father carries in a pouch until they hatch.

## Sea Urchin Facts

1. A sea urchin is covered with prickly spines.
2. It has five teeth and can scrape algae off the rocks for food.
3. The sea urchin moves with tube feet.
4. They are often found in tide pools and are eaten by birds, seastars, cod, lobster, and foxes.

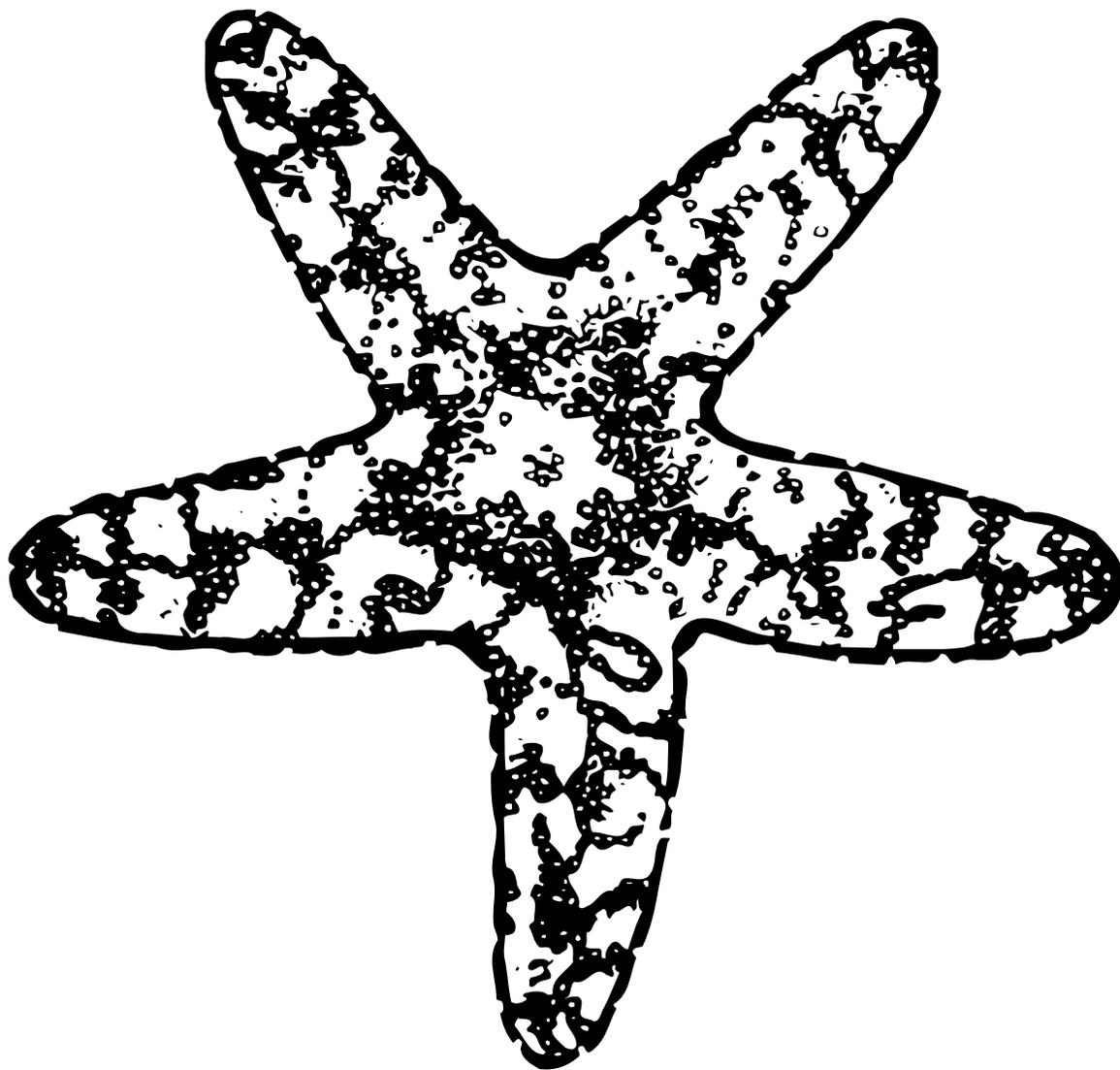
## Jellyfish Facts

1. Jellyfish are simple animals with no bones - invertebrates.
2. Jellyfish can be different shapes.
3. They are made of jelly-like tissue.
4. Jellyfish have tentacles they use for protection by stinging their prey. Their sting can paralyze or kill slow tiny creatures.
5. They float on the surface of the ocean.

## Starfish Facts

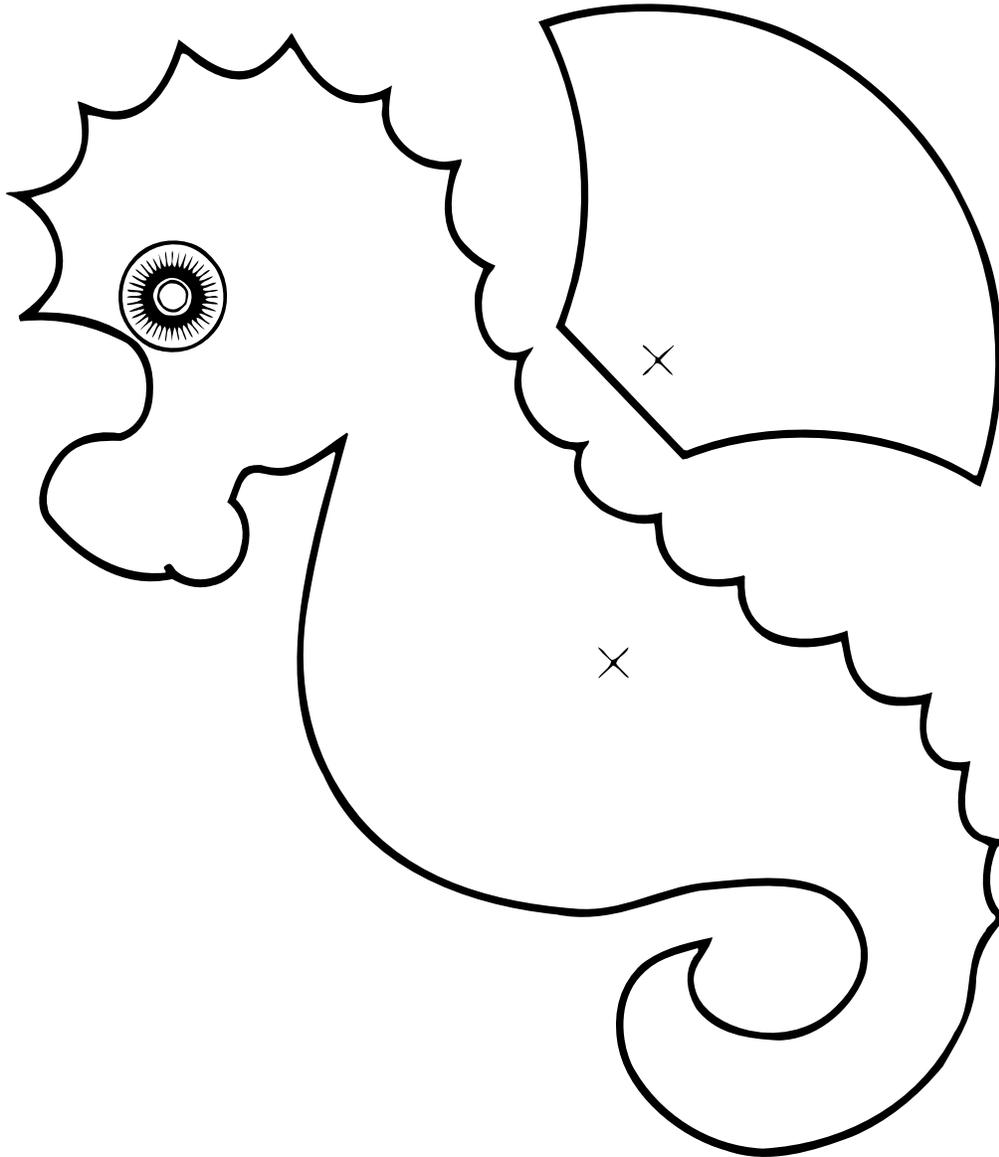
1. Starfish are star-shaped sea animals that live in or on the sand of the ocean floor.
2. Starfish have radial symmetry and have arms connected by a central disc.
3. There are many spines scattered over the surface of the arms and central disc.
4. The mouth is located on the bottom surface directly in the center of the starfish.
5. They move about with tubular walking feet.

## Starfish Pattern



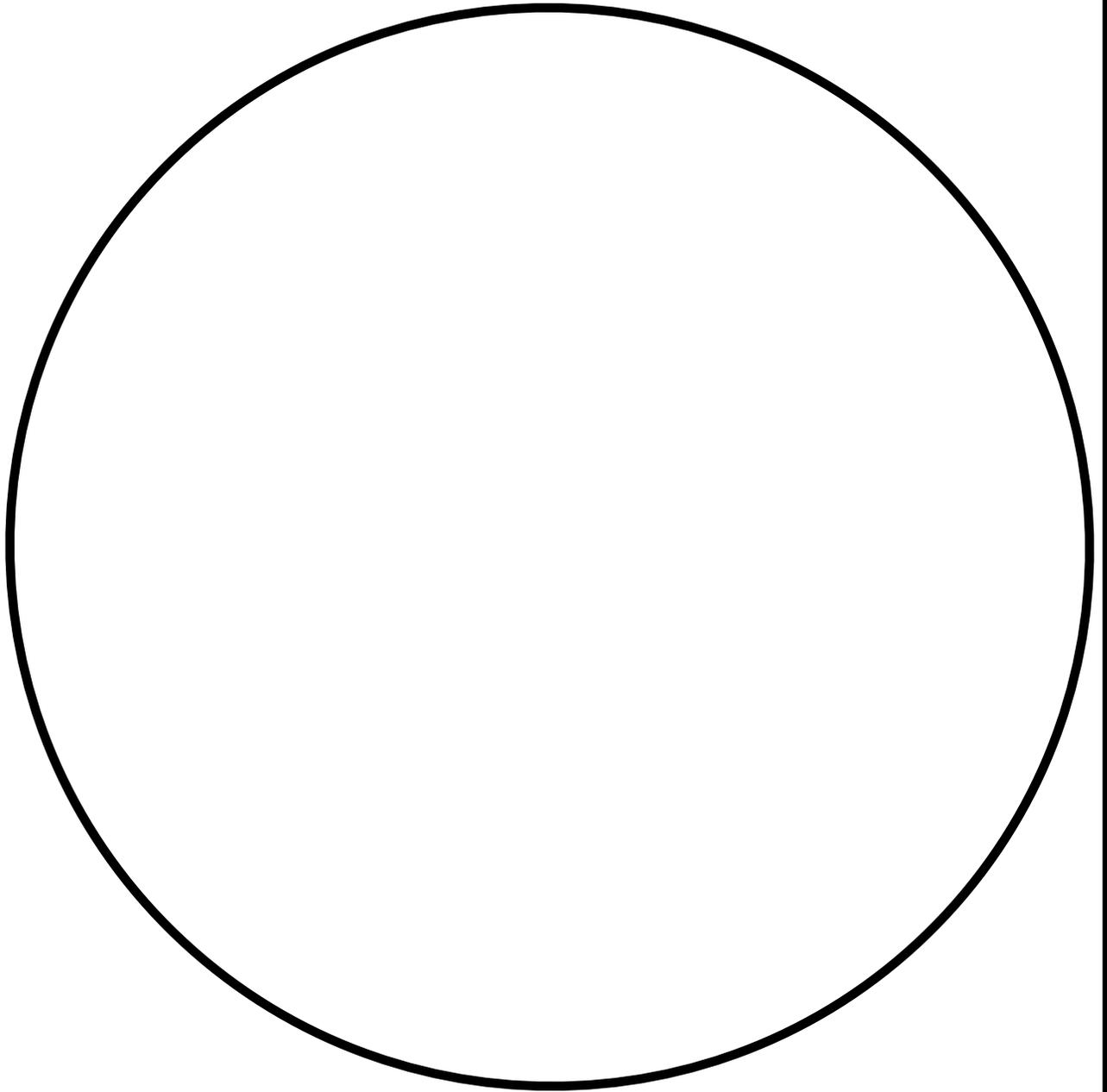
1. Trace on yellow construction paper. Cut out and glue on crushed shredded wheat or cereal.
2. Trace on card stock. Cut and cover with glue. Provide many different items to press in glue, including glitter, beads, or rice.
3. Copy on card stock. Color, smear glue all over starfish, press in sand. Lift carefully. Let dry. Display.

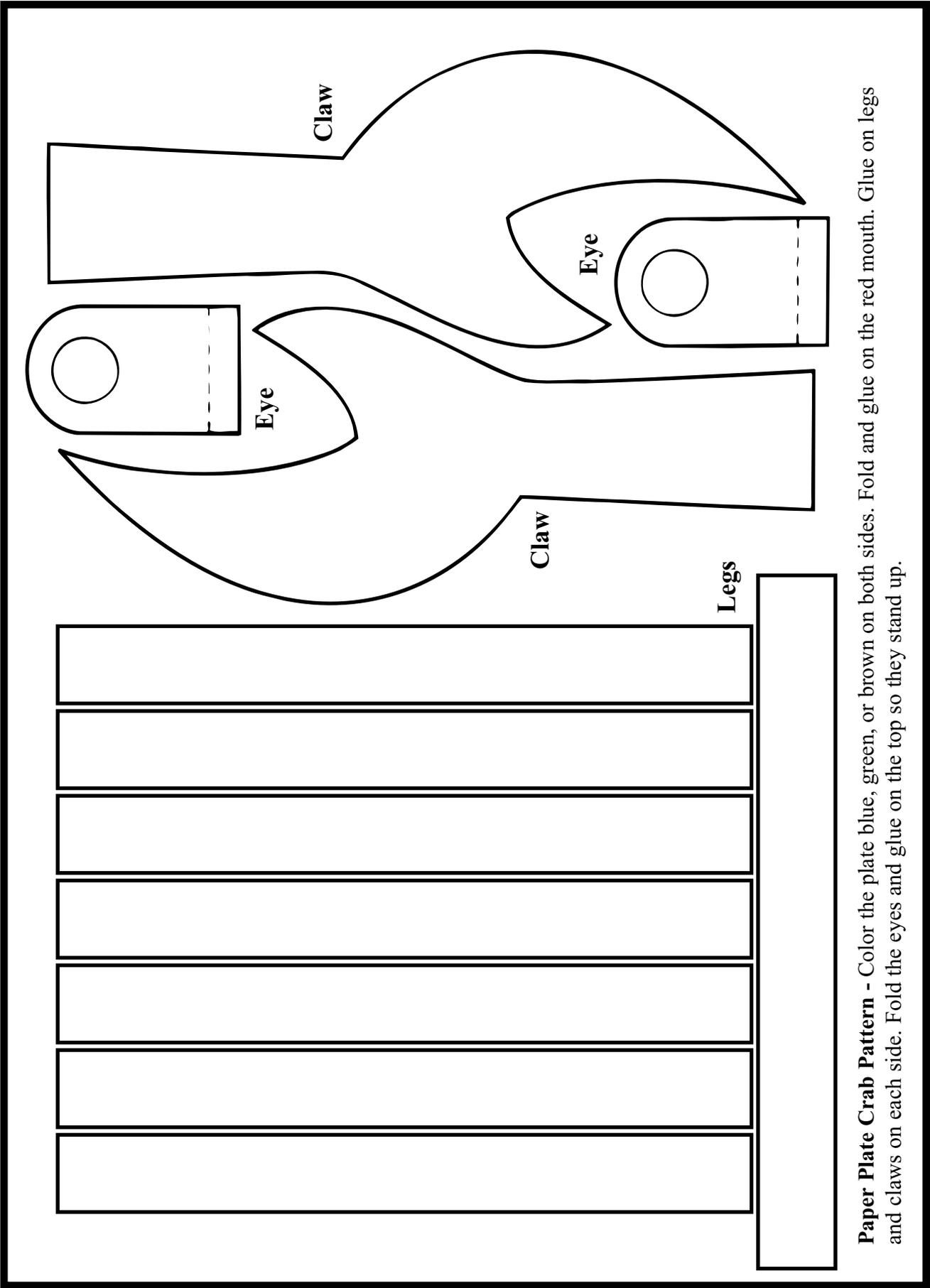
## Seahorse Pattern



Trace seahorse on brown construction paper. Cut out, trace with glue, and sprinkle with sand.  
Trace the fan flipper on plain paper.  
Cut out and attach with a brad. Fold paper back and forth to make a “fan.”

**Crab Mouth  
Cut 1 - Red**





**Paper Plate Crab Pattern** - Color the plate blue, green, or brown on both sides. Fold and glue on the red mouth. Glue on legs and claws on each side. Fold the eyes and glue on the top so they stand up.

## OBJECTIVES:

The student will be able to:

1. Explain the importance of fish in the balance of nature.
2. Identify some uses of fish.
3. Name ways fish are different from each other.

## BACKGROUND:

Fish are an important part of the aquatic ecosystem. They serve as food to other types of fish and sea life as well as people. Fish come in many sizes, shapes, and colors. The sea horse, for example, has a head that looks like a tiny horse. Some fish are flat, like the flounder, which enables them to hide on the ocean floor. Many fish have scales which are added in rings as they grow. Most fish travel in groups called *schools*.

## VOCABULARY:

**flounder** - a type of flatfish

**scales** - thin plates that cover the body of a fish

**sea horse** - a tiny fish whose head looks like a tiny horse

## ADVANCE PREPARATION:

1. Have several pictures of different types of saltwater fish arranged for the children to compare and discuss.
2. Gather materials.

## PROCEDURE:

### *Setting the Stage*

Talk with the students about the importance of fish. Ask the students to name some animals that eat fish. Do any of the students eat fish? What kind of fish do they like? Show them some pictures of fish and talk about how they are alike and different. Talk about some of the fish that are very different from others such as the sea horse and the flounder.

### *Activity*

Read half of the book *The Rainbow Fish* by Marcus Pfister. Have students predict what the rainbow fish will do in the end. Finish the book. Talk about how this fish was different from the other fish. Talk about what he did to make himself happier and become more like the others. Discuss the fact that when a fish loses one of his scales, another grows back in its place. Explain that this is a make-believe story about a fish. Talk about needs of fish. Was the scale a need or a want? A fish needs food, space, water, air.

### *Follow-Up*

Using the fish patterns available, have students create their own fish. They can either color it different colors and touch it up with glue and glitter or create scales by gluing on sequins after first coloring the fish. Have each student come up with descriptive works to tell about the fish. These can be displayed along with the fish.

## Grades:

K-2

## Subjects:

Science, Art, Language Arts

## Time Needed:

45 minutes

## Materials:

*The Rainbow Fish* by Marcus Pfister

Rainbow Fish pattern

crayons

scissors

glue

glitter or sequins (optional)

pictures or samples of different kinds of fish

## **EXTENSIONS:**

1. Write a story titled, "If I were the Rainbow Fish, would I give up my scales?"
2. Extend the story lesson to talk about friendship and what to do to make and keep friends.
3. Make a multi-layered paper fish illustrating the different aspects of a fishes anatomy shown on the sheet.
4. Purchase a whole fish from a fish market. Store on rock salt. Let the children touch the scales and examine the fish. Make "fish prints" by covering one side of the fish with thin tempera paint. Press the painted side firmly onto butcher paper. Remove the fish to reveal a beautiful "scaly" print.

## **ORIGINAL DEVELOPMENT RESOURCES:**

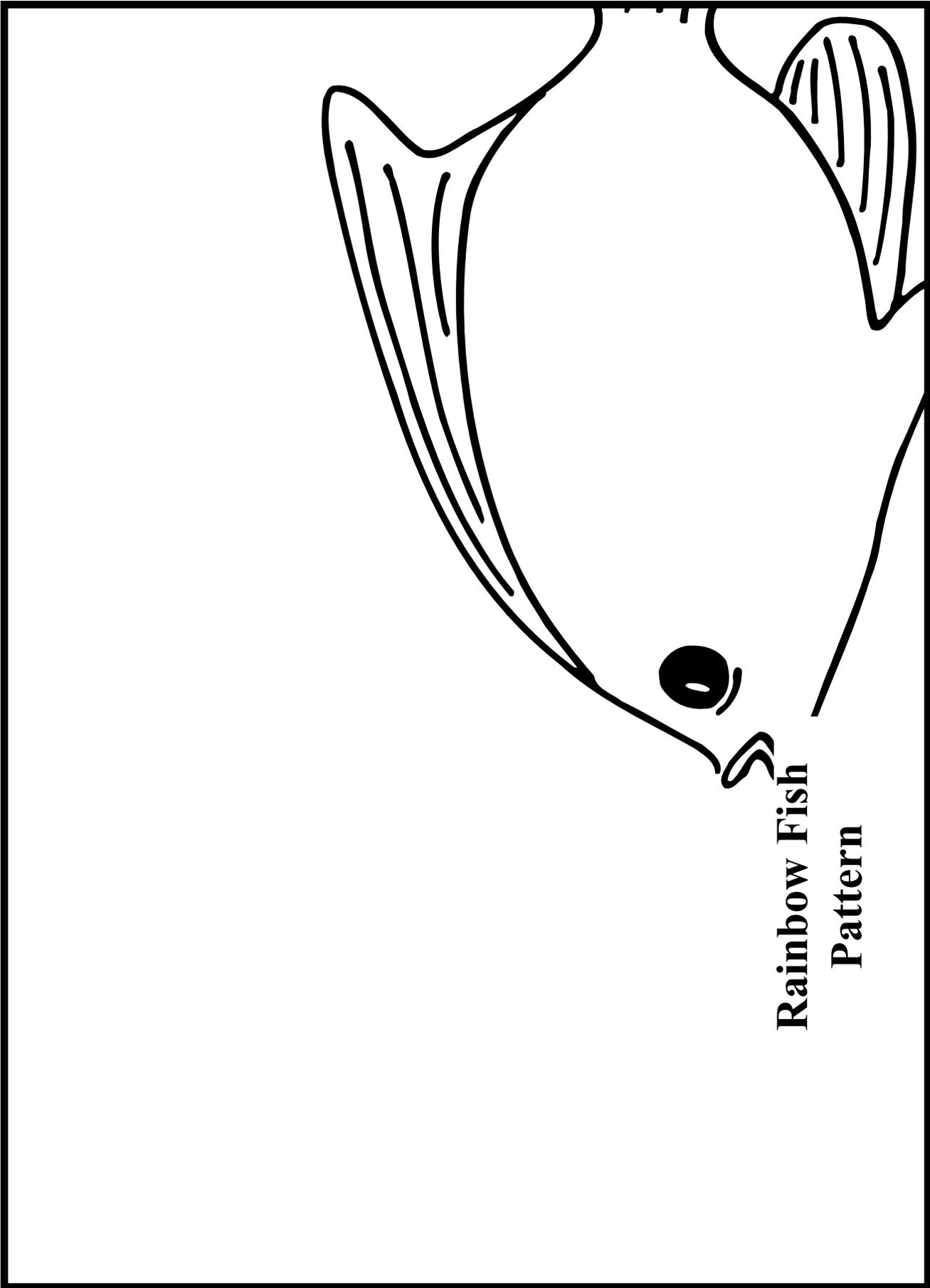
Pfister, M. (1992). *The rainbow fish*. New York, NY: HarperFestival.

Pfister, M. (1995). *Rainbow fish to the rescue*. New York, NY: HarperFestival.

Pfister, M. (1998). *Rainbow fish and the big blue whale*. New York, NY: HarperFestival.

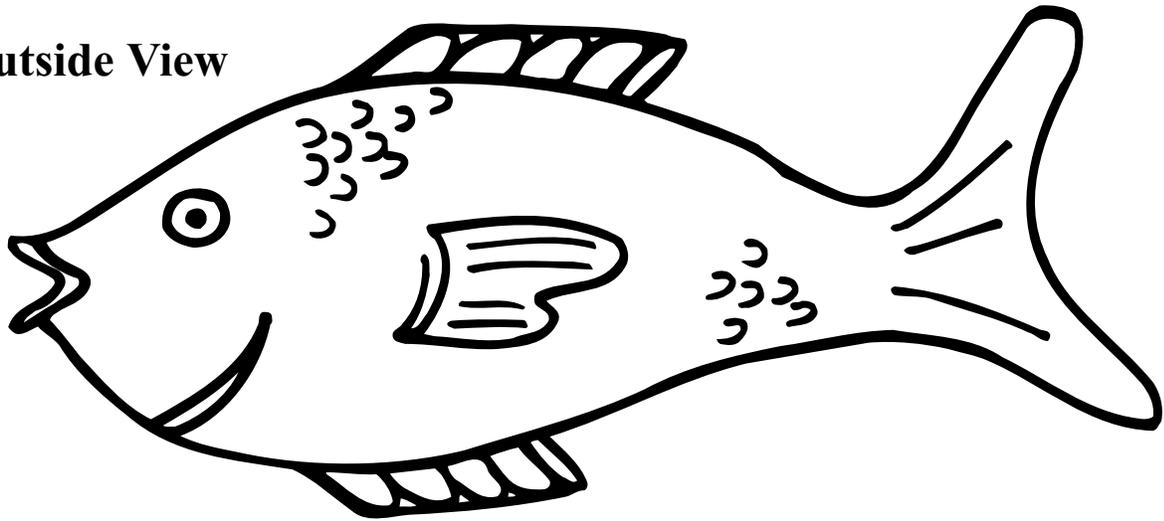
Pfister, M. (2001). *Rainbow fish and the sea monster's cave*. New York, NY: HarperFestival.

Pfister, M. (2002). *Rainbow fish: the dangerous deep*. New York, NY: HarperFestival.

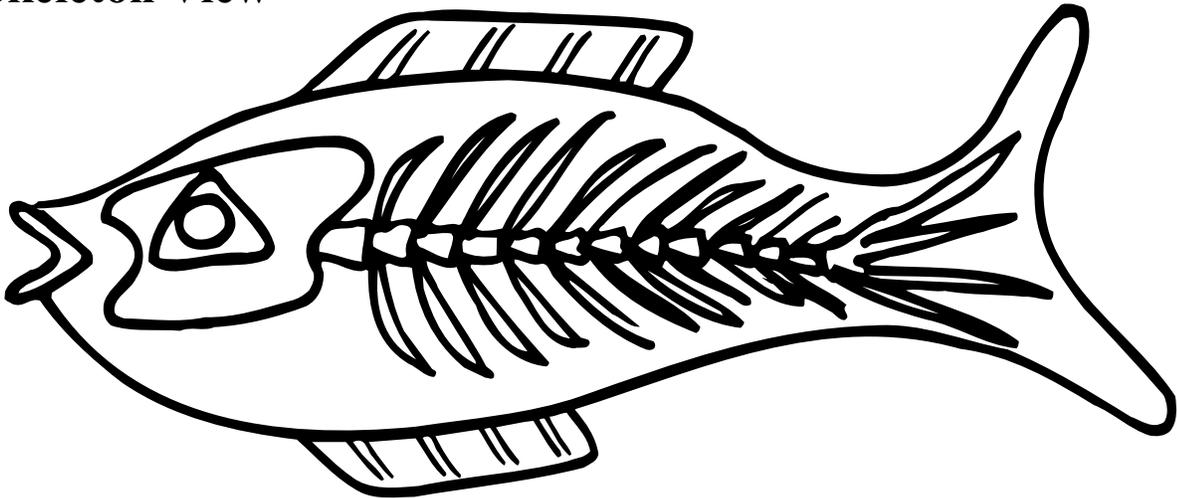


**Rainbow Fish  
Pattern**

**Outside View**



**Skeleton View**



**Inside View**



## OBJECTIVES:

The student will be able to:

1. Define what a shell is used for.
2. Identify several different kinds of shells.
3. Define the two groups of shells. (univalves and bivalves)

## BACKGROUND:

Many animals build “forts”, or shells, around themselves for protection. These shells can be found on the shores of the sea in an endless variety of shapes and colors. The outside of the shell may be white, brown, black, tan, purple, red, or rose. Some have a pattern combining several colors or shades. The inside of the shell is usually paler and more delicate. Shells exist in a variety of shapes also. Many closely resemble natural objects or human-made objects and are known as harp, helmet, razor, cone, basket, frog, ear, and slipper shells.

Shells can usually be grouped into two categories, univalves and bivalves. Univalves are shells that have one piece such as snails. Most univalves are cone-shaped with a spiral. Bivalves have two pieces hinged at the back such as oysters and clams.

## VOCABULARY:

**bivalve** - shells that have two pieces hinged at the back

**univalve** - shells that have one piece

## ADVANCE PREPARATION:

1. Prepare a shell collection with both univalves and bivalves.
2. Prepare shell identification activity. (Sheet included.)
3. Gather easy shell identification books.
4. Prepare shell memory game. (Included - make two copies for each game.)
5. Prepare shell puzzle sheets. (Included)

## PROCEDURE:

### *Setting the Stage*

Read the book *A House for Hermit Crab* by Eric Carl. At the conclusion, have students generate a list of the types of “homes” on the seashore. Tell students that a seashell is a house for a hermit crab. Talk about how shells are homes for many kinds of sea creatures. Shells are also used for protection. The inside of the shell is smooth so that creatures can easily move inside and not hurt themselves.

### *Activities*

Several shell centers can be made available.

1. Provide a shell sorting center where shells can be sorted in a variety of ways: univalves and bivalves, color, shape. Students can count or graph the different kinds.
2. Provide a shell identification activity. Number the shells and have students write these on the shell identification page. The teacher can make an answer key. Provide simple shell identification books and common shells.

## Grades:

K-2

## Subjects:

Science, Math

## Time Needed:

45 minutes

## Materials:

collection of shells

easy shell identification books

shell identification sheets per student

shell memory game

shell puzzles

*A House for Hermit Crab* by Eric Carl

Gem clip or brad for spinner

3. Tell addition stories by using macaroni shells and story boards. (Beach picture included)
4. Play shell memory. (Pattern included)
5. Learn to use a compass rose with a “shell” map game. Make copies of the sample grid provided and direction cards. Teacher spins cardinal directions off card and students move their shells in the appropriate direction.
6. Write poems about shells on the Shell Poem Sheet. (Pattern included)

*Follow-Up*

1. Have students use characters from *A House For Hermit Crab* to retell their own hermit crab story.
2. Make shell activity centers available for individual work as the class continues to study ocean ecology.

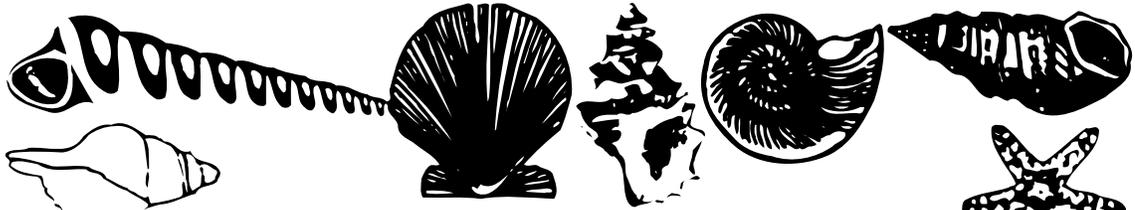
**EXTENSIONS:**

1. Students can do an art project with tempera paint and shells or shell patterns making shell prints or stencils.
2. Fill a jar with small shells or shell macaroni and do an estimation activity.

**ORIGINAL DEVELOPMENT RESOURCES:**

*Compton's interactive encyclopedia 2000.* Compton's New Media, Inc.

Hoberman, M.A. (1982). *A house is a house for me.*



## Shell Identification



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

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

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

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

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

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

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

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

9. \_\_\_\_\_

10. \_\_\_\_\_



# Shell Math Problems

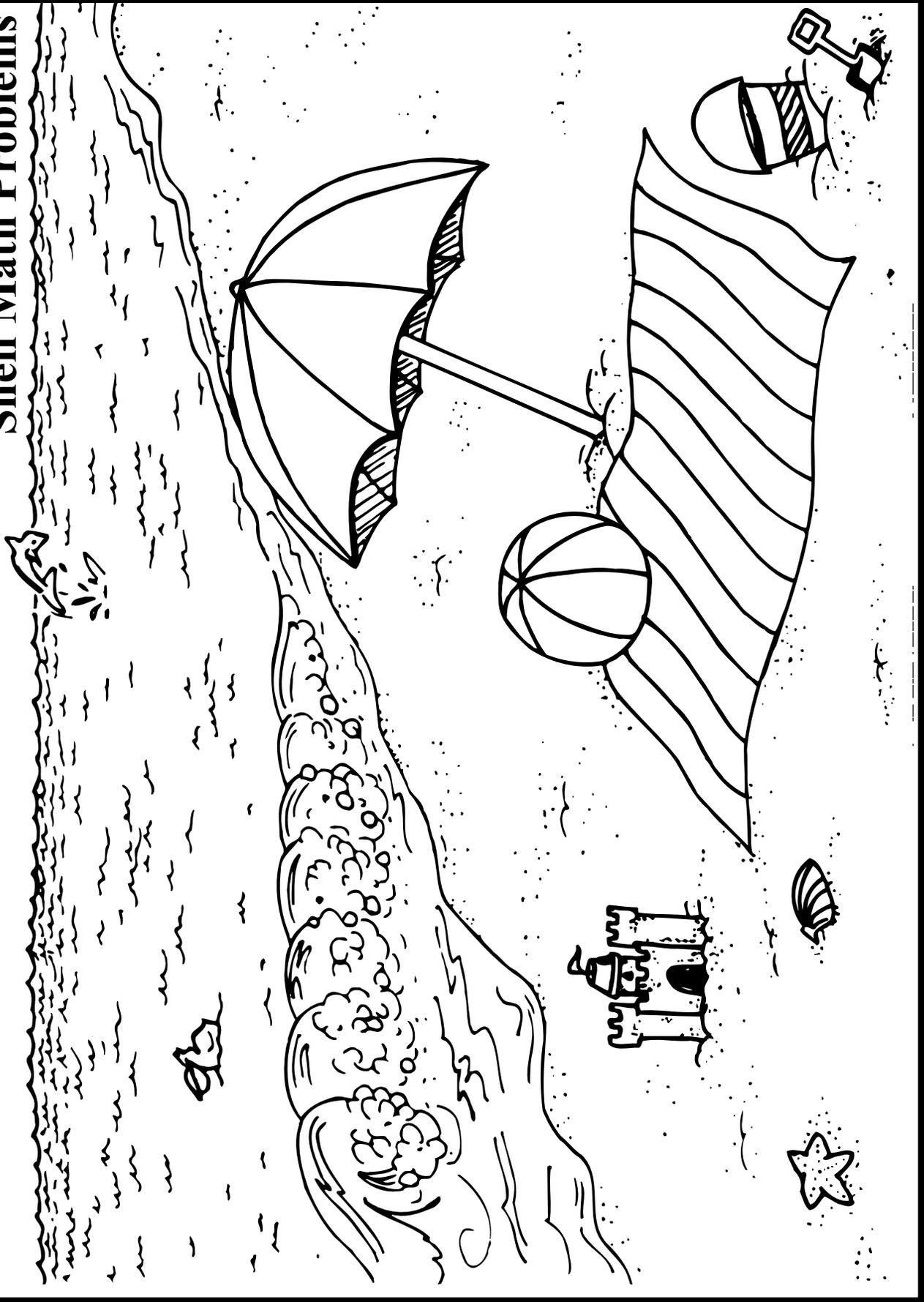
1. Tell the children you are going to give them some math problems using shell macaroni.
2. Create several problems using shell macaroni.

Example: Place 10 shells on the beach (Picture sheet). Then say the ocean's waves washed 3 back into the water. Ask the children to take 3 off. Count how many shells are left on the shore.

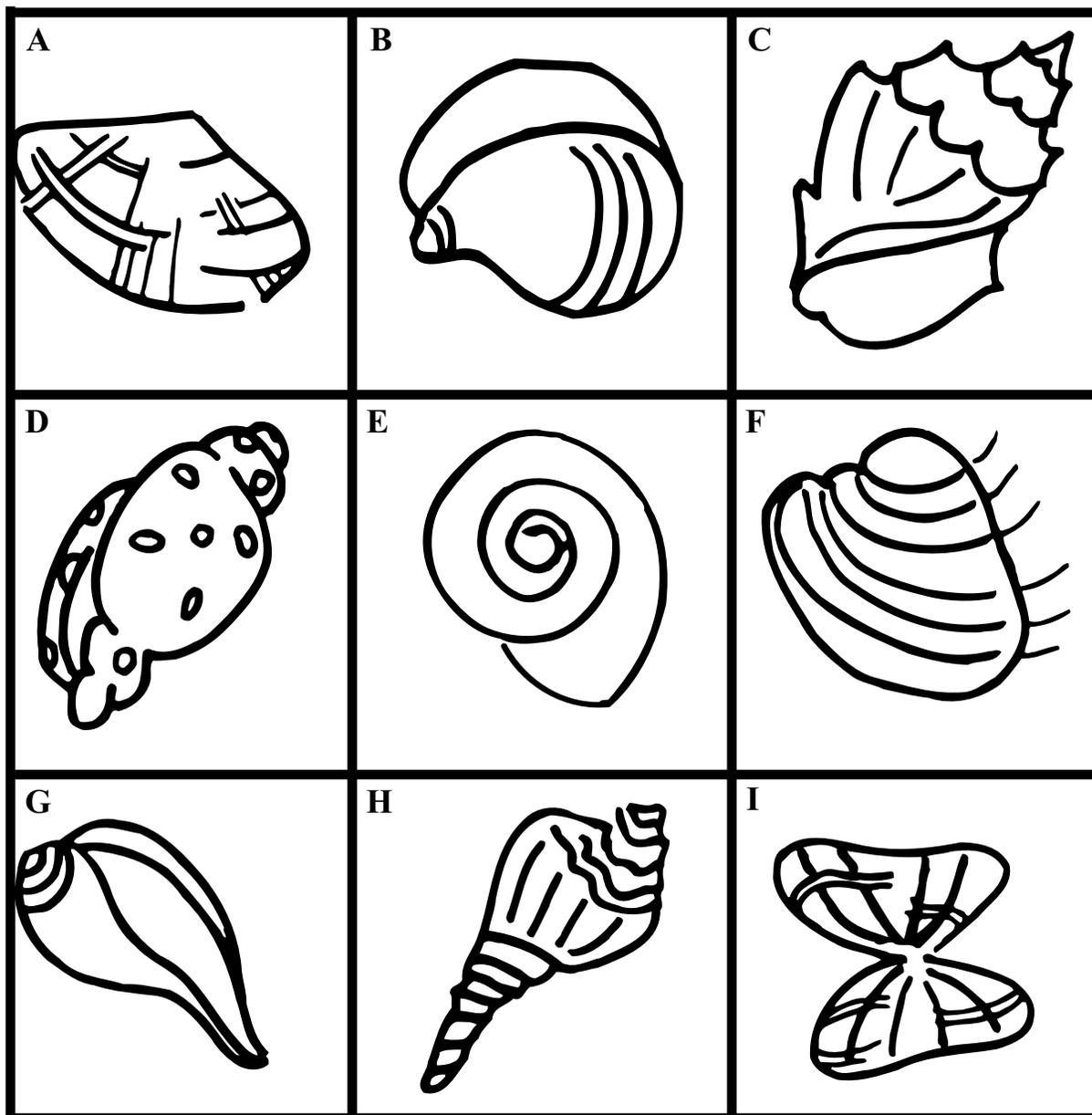
3. You can continue in this way, making the problems more challenging each time. After practice the children can eventually make up their own problems. You can add ocean facts into the problems.

Example: There were 6 bivalve shells on the ocean floor. Homes were needed by 8 crabs. How many crabs will be homeless?

# Shell Math Problems



# Shell Memory

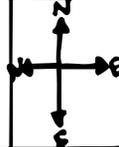
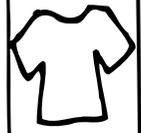
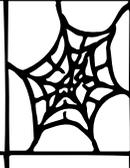
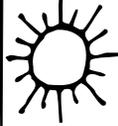
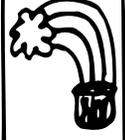


**A** Sunrise Tellin  
**B** Blue Mussel  
**C** Crown Conch  
**D** Textile Cone  
**E** Shark's Eye

**F** Royal Comb Venus  
**G** Paper Fig  
**H** Left-handed Whelk  
**I** Coquina

# Shell Map Game

N

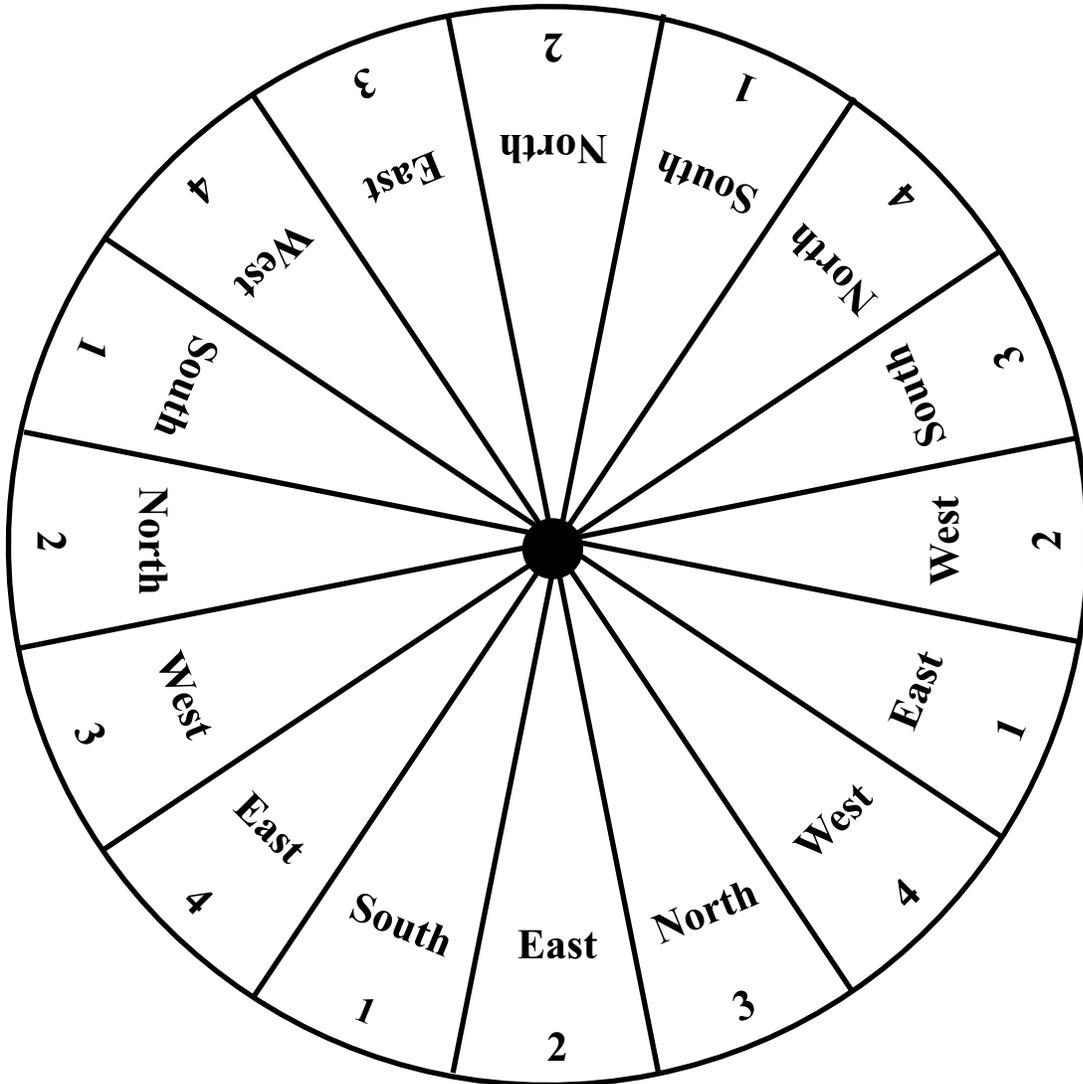
							
							
							
							
							
							
							
							
							

W

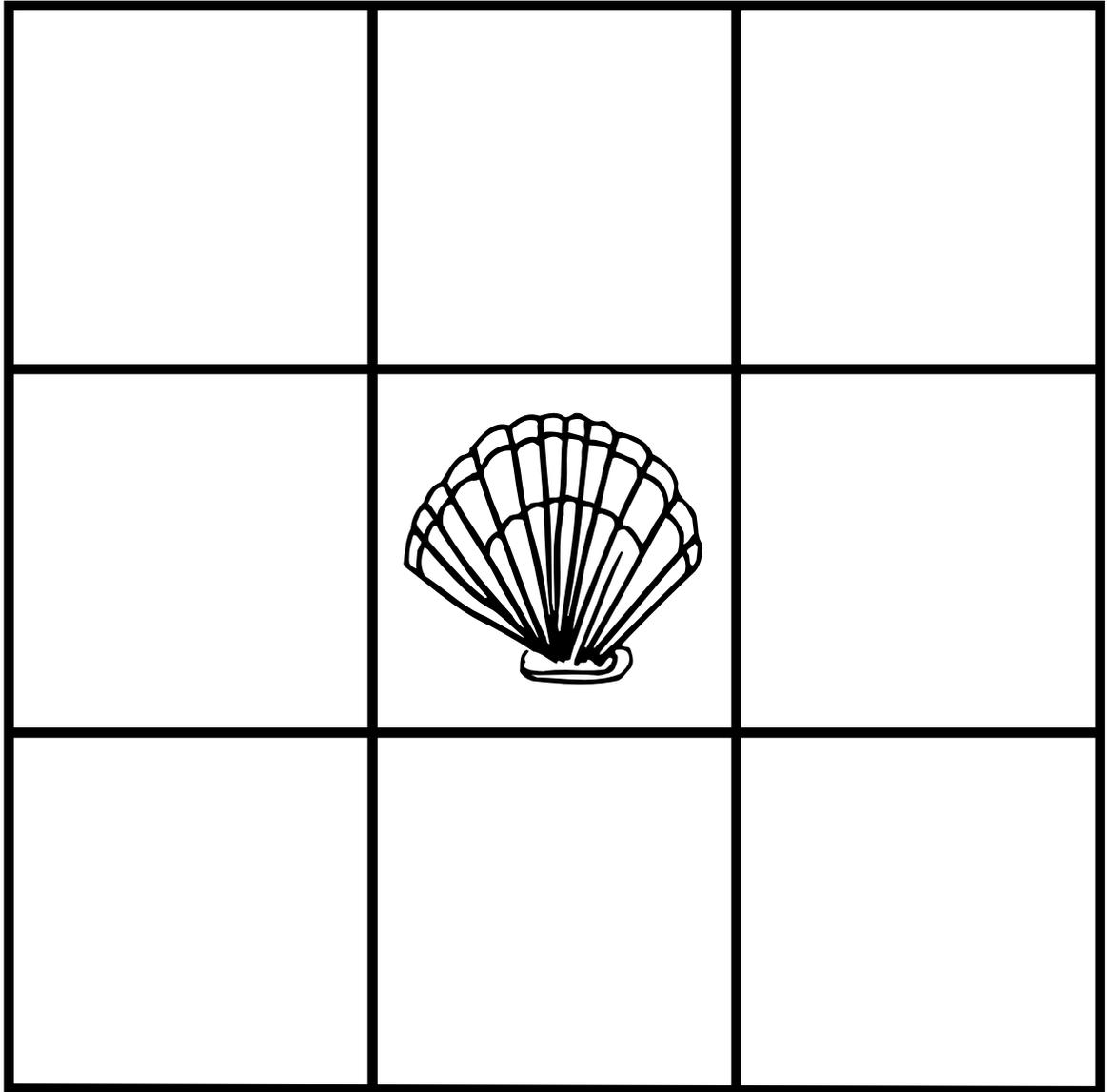
E

S

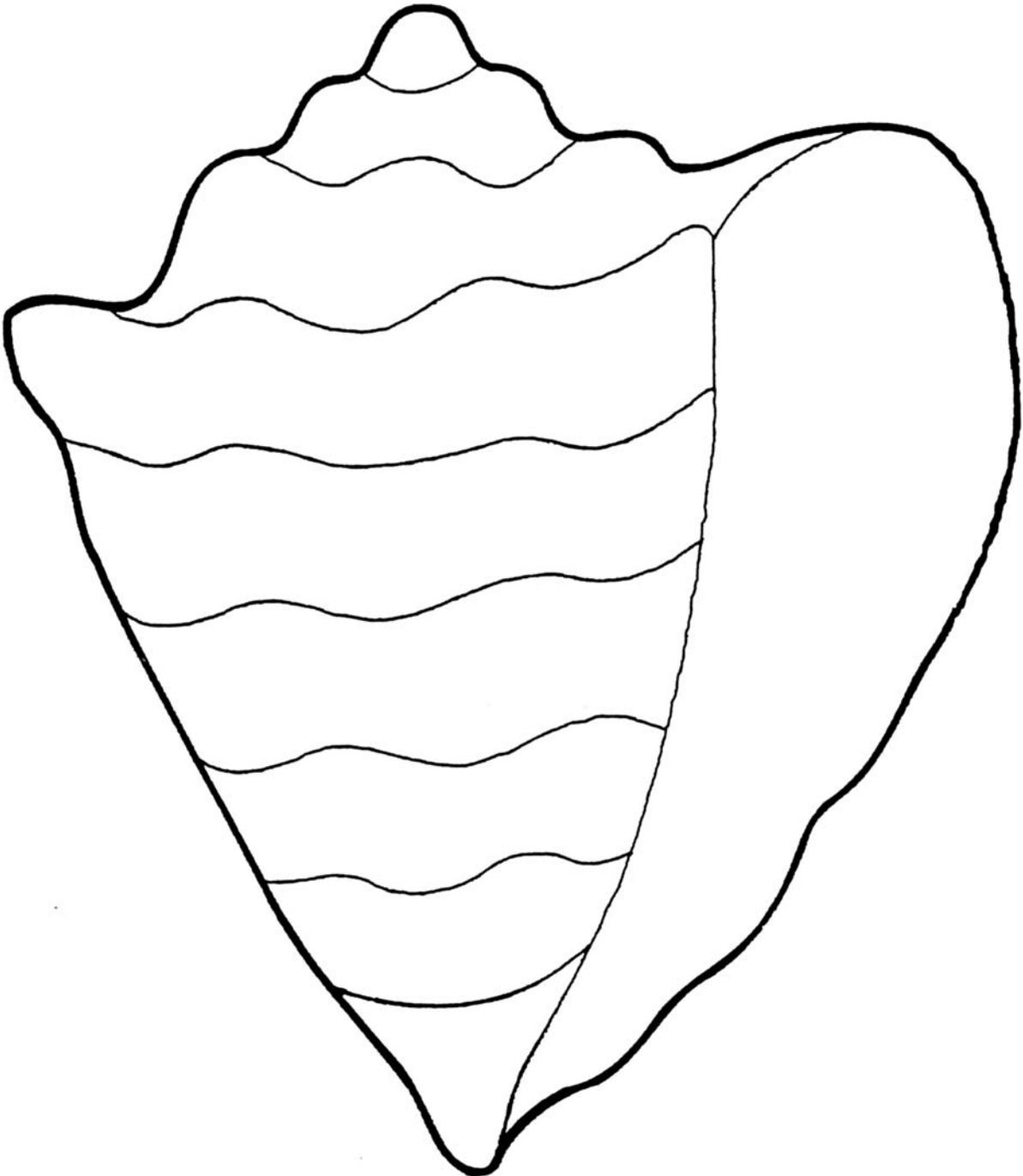
# Shell Map Game



# Shell Memory Game



# Shell Poem Sheet



<b>K-2 Correlation</b>					
<b>Chapter 1 Ecology</b>	<b>Mathematics</b>	<b>Science</b>	<b>Language Arts</b>	<b>Social Studies</b>	<b>Realted Arts</b>
<b>Who Needs a Tree? (pg. 3)</b>		<b>X</b>	<b>X</b>		
<b>We Can All Help (pg. 7)</b>		<b>X</b>	<b>X</b>	<b>X</b>	
<b>Who’s Hiding Here? (pg. 11)</b>		<b>X</b>			<b>X</b>
<b>A Plant’s Friend (pg. 17)</b>	<b>X</b>	<b>X</b>	<b>X</b>		
<b>Spring Surprise (pg. 21)</b>	<b>X</b>	<b>X</b>	<b>X</b>		
<b>Nest Sweet Nest (pg. 25)</b>	<b>X</b>	<b>X</b>	<b>X</b>		
<b>Going, Going, Gone (pg. 29)</b>		<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>
<b>Life Under a Log (pg. 33)</b>	<b>X</b>	<b>X</b>		<b>X</b>	
<b>Life Near a Pond (pg. 35)</b>		<b>X</b>			
<b>Wiggling Willie (pg. 43)</b>		<b>X</b>	<b>X</b>		<b>X</b>
<b>Bats, Bats, Bats (pg. 49)</b>		<b>X</b>			
<b>Exploring the Gulf (pg. 55)</b>		<b>X</b>		<b>X</b>	
<b>Life in the Gulf (pg. 59)</b>		<b>X</b>			<b>X</b>
<b>Fabulous Fish (pg. 67)</b>		<b>X</b>	<b>X</b>		<b>X</b>
<b>Shells (pg. 71)</b>		<b>X</b>			

<p style="text-align: center;"><b>K-2 Correlation</b></p> <p style="text-align: center;"><b>Chapter 2</b></p> <p style="text-align: center;"><b>Pollution Prevention</b></p>	<b>Mathematics</b>	<b>Science</b>	<b>Language Arts</b>	<b>Social Studies</b>	<b>Realted Arts</b>
The Whump World (pg. 83)		<b>X</b>	<b>X</b>		<b>X</b>
Critter Litterbugs (pg. 85)		<b>X</b>	<b>X</b>		<b>X</b>
Life in a Fishbowl (pg. 89)		<b>X</b>	<b>X</b>	<b>X</b>	
Captain Bob and His Friends (pg. 93)		<b>X</b>	<b>X</b>		<b>X</b>
Mini-Water Treatmetn Plant (pg. 97)		<b>X</b>			
Up in the Air (pg. 99)		<b>X</b>			<b>X</b>
Mr. Grabagio (pg. 103)		<b>X</b>	<b>X</b>		<b>X</b>
Noise in Your Neighborhood (pg. 107)		<b>X</b>	<b>X</b>	<b>X</b>	
Speakers for the Earth (pg. 111)		<b>X</b>	<b>X</b>		

<p style="text-align: center;"><b>K-2 Correlation</b></p> <p style="text-align: center;"><b>Chapter 3</b></p> <p style="text-align: center;"><b>Waste Management</b></p>	<b>Mathematics</b>	<b>Science</b>	<b>Language Arts</b>	<b>Social Studies</b>	<b>Realted Arts</b>
<b>What is Trash? (pg. 115)</b>		<b>X</b>			
<b>Garbage Pizza (pg. 117)</b>		<b>X</b>			
<b>Junk Mail (pg. 121)</b>	<b>X</b>	<b>X</b>			<b>X</b>
<b>Plenty of Packaging (pg. 123)</b>	<b>X</b>	<b>X</b>			
<b>Garbage Brakdown (pg. 125)</b>	<b>X</b>	<b>X</b>	<b>X</b>		
<b>Reduce (pg. 131)</b>	<b>X</b>	<b>X</b>			
<b>Mini-Landfill (pg. 133)</b>		<b>X</b>	<b>X</b>		
<b>Nature Recycles (pg. 137)</b>		<b>X</b>			
<b>Paper from Paper (pg. 139)</b>		<b>X</b>	<b>X</b>		
<b>Six-Pack Math (pg. 141)</b>	<b>X</b>	<b>X</b>			
<b>Trash Tunes (pg. 143)</b>		<b>X</b>			<b>X</b>
<b>Mission Recycle (pg. 145)</b>		<b>X</b>			<b>X</b>
<b>Garbage Gardens (pg. 147)</b>	<b>X</b>	<b>X</b>			

<p style="text-align: center;"><b>K-2 Correlation</b></p> <p style="text-align: center;"><b>Chapter 4</b></p> <p style="text-align: center;"><b>Natural Resources</b></p>	<b>Mathematics</b>	<b>Science</b>	<b>Language Arts</b>	<b>Social Studies</b>	<b>Realted Arts</b>
<b>Johnny Appleseed: Friend of the Trees (pg. 151)</b>		<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>
<b>Many Kinds of Soils in Alabama (pg. 155)</b>		<b>X</b>			
<b>Surface Eriasion: A Grass Roots Solution (pg. 157)</b>		<b>X</b>			
<b>The Gift of a Tree (pg. 161)</b>		<b>X</b>	<b>X</b>		
<b>What is a Beach? (pg. 165)</b>		<b>X</b>			
<b>When I was Young in the Mountains (pg. 167)</b>		<b>X</b>	<b>X</b>	<b>X</b>	
<b>Fake a Fossil (pg. 169)</b>		<b>X</b>			
<b>The Water Cycle (pg. 171)</b>		<b>X</b>	<b>X</b>		
<b>Our Blue Planet (pg. 177)</b>		<b>X</b>		<b>X</b>	<b>X</b>
<b>Air, Air Everywhere (pg. 179)</b>		<b>X</b>			
<b>How We Use the Land for Fun and Profit (pg. 181)</b>			<b>X</b>	<b>X</b>	
<b>Using Our Natural Resources for Agricultural Production (pg. 187)</b>		<b>X</b>	<b>X</b>		
<b>Old King Cotton (pg. 191)</b>	<b>X</b>		<b>X</b>	<b>X</b>	
<b>Alabama Peanut Party (pg. 193)</b>	<b>X</b>	<b>X</b>		<b>X</b>	<b>X</b>

# INTRODUCTION TO POLLUTION PREVENTION

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Many satellites put in orbit by the United States and other countries have included geographic image surveys as part of their missions. Not only have those images clearly illustrated the beauty and diversity of the planet's surface, but also those images have shown that it is isolated and self-contained. Although enormous in scale, the Earth is not infinite nor are its resources. While the planet can support an abundance of life and even can absorb some level of pollution, its carrying capacity (the amount of life supportable through resource allocation and use) is fixed. Because of this, the combination of natural and human-made detrimental effects, including pollution, must be considered to ensure that the carrying capacity is not exceeded.

The effect of natural or human-made change on Earth is often difficult to determine and is speculative on a worldwide scale, although studies of individual ecosystems and smaller geographic areas prove less difficult to measure. Instances of pollution can be investigated to determine effects and risks posed. Environmental studies and analyses have received increasing attention in past decades. Only through education can we as citizens become informed enough to make accurate and responsible decisions about our environment. The focus of this chapter is environmental pollution, either occurring naturally or human-made. There are two fundamental reasons for our concern with environmental pollution: (1) human health, welfare, and resource needs and (2) concern about the rest of nature.

## **Human Health, Welfare, and Resource Needs**

Our personal concern with environmental pollution mainly revolves around health problems from natural, as well as human-made, pollutants. Human health and well-being can be impacted by environmental pollution in two distinctly different ways: (1) on a personal level by detrimental health due to contamination or depletion of water, air, and other needed resources or (2) by reduced social and economic benefits or degradation in a geographic, ecosystem, or global context through slow deterioration of our habitat or decreasing availability of resources.

The cost of control and remediation measures for pollutants sometimes is reflected in health-care costs to treat afflictions caused by pollution. Reduced or eliminated mental well-being or recreational benefits often are overlooked and are underestimated because of the difficulty in quantifying costs. The cost of the inability to fish a stream segment because of aquatic pollution, to stay outdoors for extended periods because of elevated ozone levels, or to play in areas contaminated by pollution is difficult to determine economically. Maintaining a healthy and sustainable environment for these activities often runs contrary to human and economic needs for population, urban, agricultural, and manufacturing growth and development.

## **Concern for Nature**

Concern for nature other than that readily identified as healthful or economically beneficial has been a part of human existence for centuries. For example, there are many things about the balance of nature that we don't know. The loss of some species may throw off that delicate balance in ways that we cannot foresee at the time. This is a major theme of the modern environmental movement. Although many concerns mainly address human enjoyment, nature has value simply in its existence. Consider, for example, the number of people who place value in the protection of endangered species and the national park system, even though they have never seen an Indiana Bat or visited Little River Canyon. This protection of nature does not come without a price to all of us. Some resources have to be left unclaimed, some land has to be left undeveloped, and funds must be spent on protection and preservation of the delicate balance of nature.

## **Cultural Change**

One of the major factors in the creation of environmental pollution stems from the consumption of resources, production and manufacture of goods, and disposal of wastes. Demand from citizens for a ready supply of goods increases as the population increases. Technology offers more products to make our lives better and easier, and our purchasing power increases.

The controversy over the creation of pollution traditionally has focused on finger pointing and on placing economic matters above environmental concerns. Industry, government, and public groups have not always realized that environmental protection and economic growth do not have to be mutually exclusive. Government regulation, industry initiative, and public demand have caused great improvements to be made in the area of environmental protection. Better process design, control measures, and pollution prevention activities to reduce or eliminate pollutants at the source have reduced much pollution. Although great successes have been achieved, much more must be done in order to protect human health and the environment from pollutants.

A cultural change continues in the way many Alabamians work and play. Businesses, industry, agriculture, and other activities continue to make improvements in their operations. Collectively, they are trying to make a difference, as are public environmental groups and government agencies who keep watch over the environment and who encourage progress. These collective actions are important to success, but what can we do individually? We must all consider our activities, taking into consideration the environmental impact they may have. The idea of “throwing it away” is a myth. Wastes do not “disappear” when we “throw it away.” All waste must be disposed of somewhere, and consumption of most materials creates at least one form of pollution from solid waste or from discharges in water or emissions into the air.

When purchasing materials and services, we must consider questions such as “What will happen to it after I use it? Can it be recycled? Can I purchase goods with less packaging? Is there a better alternative?” and finally, and most importantly, “Do I really need it?” Unfortunately, we often must act and make decisions without complete information. Educating ourselves, taking the time to get accurate information, and considering the consequences of our actions collectively and as individuals are important first steps in solving the problems created by environmental pollution.

From *World Book Encyclopedia*

## OBJECTIVES:

The student will be able to:

1. Name sources of pollution.
2. Design a story map.
3. Identify ways to help clean up the Earth.

## BACKGROUND:

In the story, *The Whump World*, Pollutians leave their devastated planet and arrive on a small lush planet inhabited by the Whumps. The Pollutians quickly chop down all the trees and build huge cities and highways, while the Whumps take refuge in caverns deep underground. Soon the Whumps' world is polluted and the Pollutians move on. The Whumps, hearing their world quiet again, return to the surface and find that new plant life is already breaking through the pavement.

## VOCABULARY:

**environment** - the world around us including water, land, air, and food

**pollution** - contamination of the environment with man-made waste

## ADVANCE PREPARATION:

1. Locate and read *The Whump World* by Bill Peet.
2. Prepare enough paper and art supplies for students in groups of four.

## PROCEDURE:

### *Setting the Stage*

1. Discuss the term "pollution" with students.
2. Ask students to give examples of pollution and write them on the board. (Brainstorming)

### *Activities*

1. Read aloud and discuss *The Whump World* by Bill Peet.
2. Divide the class into groups of four.
  - Have each member design a different segment of a story map.
  - Divide *The Whump World* into the following sections:
    - The peaceful world of the Whumps is disrupted by the arrival of the Pollutians.
    - The Whumps live underground while the Pollutians pollute their world.
    - The environment becomes so polluted that the Pollutians search for a better place to live.
    - After the Pollutians leave, the Whumps come out of hiding and reclaim their land.
3. Students will illustrate and connect the parts of the story to form a mural. Headings may also be added to the story map.

### *Follow-Up*

1. Have students write or dictate sentences about the story on strips to add to the display.
2. Allow students in each group to read their sentences from the map.
3. Discuss who the "Whumps" are on planet Earth.
4. Discuss how students can help in cleaning up Alabama, their own city, and neighborhood.

## Grades:

K-2

## Subjects:

Science, Language Arts, Creative Arts

## Time Needed:

50 minutes

## Materials:

*The Whump World* by Bill Peet  
large sheets of paper (for groups of four)  
art supplies

## **EXTENSIONS:**

1. Students can sponge paint Pollutian and Whump shapes onto the display.
2. Use this activity as an introduction to the pollution unit. Create a bulletin board that focuses on pollution. Have students draw or paint appropriate illustrations to go with each pollution problem discussed throughout the unit. As each problem is covered, students can add more information by writing and/or illustrating their ideas and solutions on sentence strips and attaching them to the bulletin board. Display related experiments or projects near the bulletin board.

## **ORIGINAL DEVELOPMENT RESOURCES:**

Markel, S. (1991, April). What rots? *Instructor*, p. 66.

Peet, B. (1970). *The Whump world*. Boston, MA: Houghton Mifflin.

(1990) Video: *The rotten truth*. The Children's Television Workshop.

## OBJECTIVES:

The student will be able to:

1. Identify sources of litter.
2. Collect litter in the environment.
3. Count and sort items gathered from school grounds.
4. Become more aware of litter.
5. Create “Critter Litterbugs” from trash.
6. Discard items in proper places.

## BACKGROUND:

Litter takes away from the beauty of the environment and can cause health-related problems as well. Some litter, such as fruit and vegetable peels, decay quickly and actually nourish the soil when composted. But plastics, glass, and metals do not decay very fast. Litter needs to be disposed of properly. Work gloves should always be worn to protect hands when cleaning up litter.

Students need to begin to understand the influence of people organizing together for a cause. Students can use their combined influence to bring about better awareness of trash problems in a school or community. They may even work together to change policies in their school, school district, and state to improve the environment.

## VOCABULARY:

**litter** - trash, wastepaper, or garbage lying scattered about

## ADVANCE PREPARATION:

1. Label five sturdy boxes: glass, metal, paper, plastic, and organic plant material.
2. Gather work gloves for each student.
3. Gather all art materials for “Critter Litterbugs.”

## PROCEDURE:

### *Setting the Stage*

1. Ask students to define the term “litterbug.”
  - Ask students if they know someone who is a litterbug.
  - Ask students if they have ever been a litterbug.
2. Explain to students that they will be creating “Critter Litterbugs.”
3. Prompt students by saying, “One day you meet a strange little creature that begins following you around. He is a dreadful litterbug, scattering trash wherever he goes. Since he is now yours, you must solve his littering problem.”
4. Divide the class in to teams of three or more.
  - Give each team a trash bag and gloves.
  - Explain that they will be gathering trash from around the school grounds.
5. Go to the area which has been littered with trash and explain to students that they will be having a Trash Pick-Up Race.

## Grades:

K-2

## Subjects:

Science, Related Arts, Language Arts

## Time Needed:

two 45 minute sessions

## Materials:

six medium sized cardboard boxes  
trash bags  
work gloves for each student  
brown paper lunch sack  
strips of crepe or tissue paper  
paint, crayons, or markers  
glue  
rubber bands  
shredded newspaper

## Activities

### Activity 1

- Go to the area which has been littered with trash.
- Explain that items should be picked up carefully with gloves on and placed in a trash bag. Caution the children not to pick pieces of broken glass.
- Give the students five minutes to collect trash.
- When a signal is given have teams run to pick up the trash.
- At the end of five minutes have the students return to the teacher.
- The team with the most trash wins.

### Activity 2

- Transport trash back to the classroom.
- Sort trash into labeled boxes.
- Graph sorted trash by types, using tallies or pictographs.
- Those items that can be reused may then be sorted from the others and placed in a separate container.
- Return or recycle what you can, discard the rest.

### Activity 3

1. Students will create “Critter Litterbugs” as follows:
  - Decorate the bag with paint or crayon. Include both the front and back view of the critter.
  - Stuff the bag with shredded newspaper.
  - Gather at the top and secure with rubber bands.
  - Glue tissue or crepe paper strips out the top.
  - Take trash items that are reusable and use to decorate “Critter Litterbugs.”
  - Cut feet from 5” squares. Glue to bottom of bag.
2. Use these story simulators with students. Stories may be written, dictated, illustrated, or told orally.
  - Where did you meet this crazy litterbug?
  - What kind of litter does this critter leave behind?
  - What problems does the litter create?
  - How do you try to solve the critter’s problem? What finally works?

### Follow-Up

1. Set the Critter Litterbugs around the classroom such as on top of cabinets, next to waste baskets, or near sink areas. Put a sign next to each one that reads, “Don’t Be A Critter Litterbug!”

## EXTENSIONS:

1. Have students keep an eye out for litter. Tell them to clean up when paper, broken pencils, and other litter collect in the area.  
(Note: Whenever possible, students should recycle or reuse the things they pick up.)
2. Students can create colorful “litter patrol” buttons to wear or signs to put on their desks. (Note: Using recycled materials for these should be encouraged.)
3. Read *Trash!* by Charlotte Wilcox.

## **ORIGINAL DEVELOPMENT RESOURCES:**

Commins, E. (1982). *Early childhood activities*. Atlanta, GA: Humanities Limited.

List, L. (1982) *Music, art and drama experiences for the elementary curriculum*. New York, NY: Teachers College Press.

Poppel, G. (1987). *The planet of trash: An environmental fable*. Bethesda, MD: National Press, Inc.

Schwartz, L. (1990). *Earth book for kids: Activities to help heal the environment*. Santa Barbara, CA: The Learning Works, Inc.

Wilcox, C. (1988). *Trash!* Minneapolis, MN: Carolrhoda Books, Inc.

# Notes

## OBJECTIVES:

The student will be able to:

1. Locate his/her hometown on a map of Alabama.
2. Describe sources of water pollution in Alabama rivers, lakes, and streams.
3. Recognize the importance of keeping water clean.

## BACKGROUND:

Fish and other water organisms need oxygen to live. Pollutants take away the oxygen in water that these organisms need. Thus the more pollutants there are, the less likely fish will survive. A few pollutants that can be found in Alabama's rivers, lakes, and streams are detergent, motor oils, and fertilizer. This activity will let students see the effects pollutants and a lack of oxygen can have on fish.

## VOCABULARY:

**decompose** - to decay or rot from a process of microbial action

**eroding** - land that is worn away or washed away

**fertilizer** - chemical applied to crops and lawns that can be washed out of the air and soil and into the water supply

**pollutant** - a substance that can harm water, air, land, or living organisms

## ADVANCE PREPARATION:

1. Locate a map of Alabama. Have a sticker to place on map for locating hometown.
2. Make fish and fishbowl (as stated in procedure).
3. Gather all ingredients and place in film canisters.
4. Locate overhead projector or flashlight. (Note: There is a danger of the water weight breaking the glass on an overhead.)

## PROCEDURE:

### *Setting the Stage*

1. Show map of Alabama.
  - Instruct students to locate their hometown.
  - Allow a student to place sticker on correct spot.
2. Locate the closest body of water.
  - Ask students to name things that live in the water.
  - Have students come up with a name for the fish in the activity. (Use the name of closest body of water for story.)
  - Explain to students they will be shown a demonstration of what can happen to fish when people pollute the water.

### *Activities*

1. The fishbowl can be made from a glass or plastic fishbowl, a pickle jar, a three-liter clear soft drink bottle

## Grades:

K-2

## Subjects:

Science, Language Arts, Geography, Social Studies

## Time Needed:

50 minutes

## Materials:

map of Alabama  
stickers  
glass fishbowl or similar container  
fish made from construction paper with contact paper and one paperclip for a weight  
overhead projector or flashlight  
nine empty film canisters with tops  
liquid dish detergent (1 tbs)  
red food coloring with water (1 tsp)  
1/4 cup of each ingredient:  
soil  
cooking oil  
salt  
paper confetti  
powdered detergent  
hot water

(remove plastic container from bottom and cut off the tapered top), or any similar container. The fish can be cut from construction paper, covered with contact paper or any other waterproof item.

- Place fish on a stick or tape to front of bowl.
- Put the bowl on an illuminated overhead projector or use a flashlight behind the “river.”

2. Read and adapt narrative. Ask individual students to add the ingredients in the film canisters as indicated to represent pollution.

**Teacher’s Note:** Teachers should review the narrative in advance and adapt the language to the students’ level.

**Narrative:** Imagine a river as it meanders through the countryside, past the farmers’ fields, widening into a lake, but narrowing again as it passes through the city. In this river named \_\_\_\_\_ lives a fish. Its name is \_\_\_\_\_. (Point to the fish in the clear water in the fishbowl). **Ask: How does it feel to be this fish?**

(This question should be asked repeatedly throughout the story and should generate an enthusiastic response from the students. Let students respond aloud.)

The fish swims down the river past an eroding bank. An eroding bank is where soil sometimes gets washed into the river. When it rains, what will happen to the bank? What if it rains a great deal? (Have student pour soil from the container into the water.) **Ask: How does it feel to be this fish?**

Suppose part of the soil eroding into the water came from farmland. The farmer has just put fertilizer on the field. Instead of staying on the field to help the crops grow, some of the fertilizer may ride “piggy-back” on the eroding soil and go into the river. (Add sand to simulate fertilizer.) What effect will the fertilizer have on the plants in the river? (It will make plants grow.) If the plants grow too abundantly and too fast, the river can’t continue to support them. They die, fall to the bottom, and start to decompose. Decomposing things use oxygen. What else in the river needs oxygen? (the fish) **Ask: How does it feel to be this fish?**

Farm fields aren’t the only source of fertilizer that can flow into a river. Homes may also be a source. Where the river has widened into a lake, several families have built their homes. Perhaps their septic tanks drain into the water, or some of the fertilizers they’ve put on their lawns have washed into the water. (Add liquid dish detergent to represent pollution from homes. Detergents have some of the same chemicals in them as fertilizers.) As the lake narrows into a river, our fish continues downstream past the city. Even though the city people don’t pollute the water directly, what they do at their own homes or subdivisions can affect the quality of the river’s water. Have you ever seen a car leaking oil? Where does the rain wash this oil? Oil covers the top of the water so oxygen cannot get in. (Put the oil into the fish bowl.) **Ask: How does it feel to be this fish?**

In the winter when it gets icy and snows, what do we put on our roads to make it easier to drive? (Salt or sand. Put salt into the water.) When you eat or drink something salty, what do you do? (You get something else to drink.) Can this fish get fresh water to drink? (No.) **Ask: How does it feel to be this fish?**

Suppose the city has a park next to the river. People litter the park, and some of it blows into the water. (Put pieces of paper into the fishbowl.) **Ask: How does it feel to be this fish?**

As the river leaves the city, there are several factories that are located along it. Although regulations are strict, if the factory’s control equipment is not working properly, some chemicals or heated water may flow into the river. (Put powdered detergent into the fishbowl and stir for effect.) **Ask: How does it feel to be this fish?**

The waste water treatment plant for the city is also located along this section of the river. The plant does its best to clean out impurities, but some polluted water gets into the river. The river has a large volume of water though, and the plant only puts a small amount of pollution into it. It shouldn't cause too much of a problem. Right? It would be like putting two drops of this food coloring into this jar of water. (Put in food coloring and stir it.) **Ask: How does it feel to be this fish?**

#### *Follow-Up*

1. Ask students if they have ever seen a river, lake, or beach closed for swimming.
2. Ask students if they would like to swim in a river like the one in the story.
3. Review story and discuss ways the students could help solve some of the problems mentioned.

#### **EXTENSIONS:**

1. Have students draw pictures of how fish and other water organisms would look if they lived in polluted waters. Allow them to draw new pictures in which the fish live in clean water and discuss the differences in the pictures. Display on bulletin board to show contrast.
2. Read or improvise as a blues tune.
3. Ask a local fish expert to come and speak with the class. Have students create questions ahead of time and send these to the guest speaker.

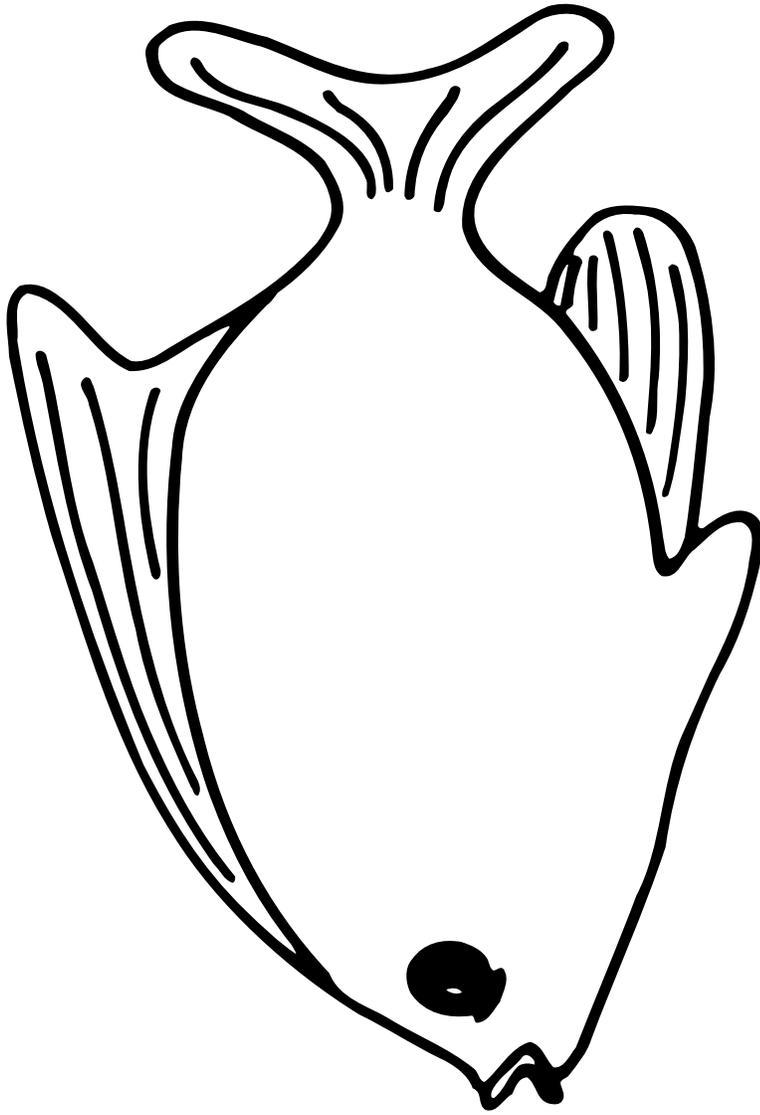
#### **THE DIRTY WATER BLUES**

Pure water gurgles  
and splashes along  
until pollution  
flows into the song:  
oil, tar, paint, dye,  
mud and muck  
come splashing by.  
Cans, jars, bottles,  
Old shoes, old news--  
that's the dirty water blues.  
Sweet fresh water  
rolls away from this song,  
while dirt and pollution  
keep flowing along,  
and along, and along.

#### **ORIGINAL DEVELOPMENT RESOURCES:**

Miles, B. (1988). *Save the Earth! An ecology handbook for kids*. New York, NY: MacMillan Publishing Co.

South Carolina Department of Health and Environmental Control, *Action for a cleaner tomorrow*. (used by permission). Call 1-800-768-7348 for trainings and workshops.



## OBJECTIVES:

The student will be able to:

1. Recognize and discuss the problems associated with marine litter and the way it affects living things.
2. Illustrate ways to help solve pollution problems by making a group mural.

## BACKGROUND:

Litter and other water pollution have become a very serious problem. There are many things that are harmful when thrown into the water. When sea gulls and pelicans get their beaks caught in plastic soft drink rings, they can starve, strangle, or drown. Oil spills are another serious problem to marine life. One solution to the problem is public education.

## VOCABULARY:

**bay** - a place in which a small body of water is set off from the main body of water and has land on three sides.

## ADVANCE PREPARATION:

1. Gather picture books and magazine pictures of sea life mentioned in play (sea turtle, sea gull, pelican). See "Exploring the Gulf" and "Life in the Gulf" in Learning Through Legacy (K-2).
2. Gather baby oil and water source for student experiment.
3. Collect materials for group mural.

## PROCEDURE:

### *Setting the Stage*

1. Show students pictures of sea life from books and magazines. Place these around the room.
2. Discuss with students what happens when fish and birds become covered with oil.
  - Allow students to dip their fingers in baby oil and rinse them off with water.
  - Discuss results.
  - Ask students to imagine what happens to fish and birds when they swim through an oil slick.
3. Ask students to name other things that would be harmful when carelessly distributed in the water.

### *Activities*

Introduce the characters of the play.

- Have students draw pictures of a sea turtle, sea gull, pelican, and Captain Bob. Cut out and glue on popsicle sticks to make puppets.
- Explain to students they will be holding up their characters throughout the play. Read the play, "Captain Bob and His Friends."

## Grades:

K-2

## Subjects:

Science, Language Arts, Creative Arts

## Time Needed:

60 minutes

## Materials:

baby oil  
water  
4 popsicle sticks for each student  
six-pack rings  
written play (included)  
children's illustrations  
butcher paper  
art supplies  
glue  
photographs of sea life

### *Follow-Up*

1. Discuss how the problems in the story could have been avoided to begin with.
2. Allow students to illustrate ways to solve pollution problems by making a group mural.  
(Note: Student illustrations of the characters may be incorporated into the mural as well.)

### **EXTENSIONS:**

1. Take a walk around the block or a nearby stream. Ask students to take a trash bag and pick up the items that do not belong.
2. Make clean water bottles and dirty water bottles.
  - Materials: two small clean water bottles, water, baby oil, trash.
  - Fill both bottles almost full of water. Finish filling dirty water bottle to top with baby oil. Put trash in dirty water bottle as well (foil, paper). Put caps on bottles.
  - Ask students which bottle they would prefer to drink.
3. Read *Down by the Bay*. A record also accompanies this book. This is a nonsense book and record.

### **ORIGINAL DEVELOPMENT RESOURCES:**

Becklake, J. (1990). *Green issues, thinking for the future: Pollution*. New York, NY: Aladdin Books Ltd.

Raffi Songs to Read (1987). *Down by the bay*. New York, NY: Crown Publishing Company.

Tice, M. *Captain Bob and his friends*.

# Captain Bob and His Friends

*It was a beautiful sunny day as Captain Bob left the pier for a day of sailing. He hadn't gone far when his friend Tom E. Sea Turtle stopped to say hello.*

**Tom E. Sea Turtle:** "Good morning, Captain Bob."

**Captain Bob:** "Good morning, Tom. How are you today?"

**Tom E. Sea Turtle:** "Not too good. My stomach hurts. I ate a plastic garbage bag by mistake. It looked just like a delicious jellyfish."

**Captain Bob:** "I'm so sorry, Tom. I hope you feel better soon." (*Captain Bob sees Sammy Seagull flying by. He sees that Sammy's face looks very sad.*)

**Captain Bob:** "Sammy, you look so sad. What's wrong?"

**Sammy Seagull:** "Oh Captain Bob, I have a fishhook caught in my foot."

**Captain Bob:** "Let me see if I can help. Maybe I can get it out."

*Captain Bob was able to get the fishhook out and put some medicine and a bandage on Sammy's foot. The wind blew, and Captain Bob steered his sailboat out into the bay. He hadn't gone far when he heard Fred and Franny Fish calling out to him. Captain Bob stopped to see what was the problem.*

**Franny Fish:** "We need your help, Captain Bob. Fred has gotten motor oil all over him! What should we do?"

**Captain Bob:** "Come here, Fred, and let me wash you off."

*Captain Bob gently washed the motor oil off Fred, and he felt so much better. Captain Bob was so glad he was able to help. As Captain Bob sailed near Rock Island, he saw Pelican Pete sitting near the water.*

**Captain Bob:** "Hello Pete. It's a fine day, isn't it?"

*Captain Bob noticed that Pete didn't answer him. Then he saw the problem. Poor Pete had his bill caught on a plastic six-pack ring. He couldn't open his mouth to talk. Captain Bob used his pocket knife to cut the ring off Pete's mouth.*

**Pelican Pete:** "I was so glad to see you, Captain Bob. I knew you could help me; from now on I'll be much more careful where I stick my bill."

*Captain Bob turned his sailboat around to start for home. He thought about all the animal friends and the problems they had. He remembered it was just last week that he had helped Danny Dolphin. Danny had gotten tangled up in fishing line. Captain Bob knew it was up to him to help his animal friends. He called a town meeting that night and told the people about the problems the animals were having. Humans were the ones who were dropping the litter in the water. The people asked Captain Bob to apologize to the animals for them. They promised to put litter in trash cans where it belongs.*

# Notes

## OBJECTIVES:

The student will be able to:

1. Identify sources of water in the community
2. Observe how water is cleaned in a water treatment plant.

## BACKGROUND:

In nature, water is not always clean and safe enough for people to drink. Water picks up all kinds of contaminants, due to pollution from homes and industries. Water treatment is the process of cleaning water and making it safe for people to drink.

Our drinking water comes from both surface and groundwater. Water in lakes, rivers, and swamps may contain impurities that may sometimes make it look and smell bad. Water that looks clean may contain harmful chemicals or bacteria and other organisms that can cause disease.

Water treatment plants clean and maintain the quality of drinking water by taking it through several processes. One of these is filtration, the process of separating matter from liquid.

## VOCABULARY:

**contaminant** - an impurity that causes air, soil, or water to be harmful to living organisms or the environment

**filtration** - the process of separating matter from a liquid

## ADVANCE PREPARATION:

Gather all materials for experiment and place them on a table in preparation for student observation.

## PROCEDURE:

### *Setting the Stage*

1. Ask students if they know where the water that is piped into their homes comes from. Investigate the water source for their community. Show the nearest lakes, streams and creeks on a map while pointing out correlating map symbols. Measure distances from their community to closest water source.
2. Discuss how water is cleaned before it is safe to drink and use in our homes
3. Allow students to move in front of experiment table.

### *Activities*

1. Place a 1 inch layer of cotton on the bottom of the screened container.
2. Add about 1 inch of coarse sand and then a 1 inch layer of gravel.
3. Set the container over the jar and slowly pour the muddy water into the container.
4. Discuss the results. (Note: Don't drink the water ! It may look clean, but it may contain bacteria.) Students should observe that appearances can be deceptive, a lake with clear water may be full of contaminants.

## Grades:

K-2

## Subject:

Science

## Time Needed:

30 minutes

## Materials:

a container with a screen bottom  
(make one or use a flour sifter)  
coarse clean sand  
clean gravel  
absorbent cotton  
a large glass jar  
muddy water

### *Follow-Up*

1. Discuss the government's role in regulating our water.
2. Allow students to repeat the experiment themselves.
3. Ask why community needs may differ. Discuss: Cities with more contaminants in the water may charge a higher rate for purifying the drinking water.

### **EXTENSIONS:**

1. Read aloud *The Magic School Bus at the Waterworks* by Joanna Cole and compare the activity with the water treatment plant described in the book. Discuss the water facts on 1-11. Children can copy facts and illustrate, displaying the importance of providing water to the community.
2. As an excellent enrichment activity, visit a water treatment plant nearby.

### **ORIGINAL DEVELOPMENT RESOURCES:**

Cole, J. (1986). *The magic school bus at the waterworks*. New York, NY: Scholastic.

Williams, R. (1991). *Ecology for kids*. Cypress, CA: Creative Teaching Press, Inc.

## OBJECTIVES:

The student will be able to:

1. Discuss several sources of air pollution.
2. Observe that burning rubbish, trash and unregulated materials (chemicals) can release visible and invisible air pollutants.
3. Explain causes of air pollution.

## BACKGROUND:

Students will learn how burning rubbish, trash and unregulated materials (chemicals) contribute to air pollution. Most air pollution is caused by people burning inappropriate materials, using low grade gasoline, and using unregulated freon in home and automobile air conditioners. Other examples of air pollutants are coal, oil, and other fossil fuels that industries use as sources of power.

## VOCABULARY:

**pollutant** - a substance that can harm water, air, land, or living organisms

## ADVANCE PREPARATION:

1. Run off a copy of Pollution Puzzler for each student.
2. Gather candle, match, and glass cover for the experiment.

## PROCEDURE:

### *Setting the Stage*

1. Ask students to give examples of air pollution they have observed.
2. Ask students to give examples of invisible air pollution.

### *Activities*

1. Place a candle where students can see it.
  - Light the candle.
  - Ask students if they see any pollution.
2. Lower the glass cover over the candle until it touches the flame.
  - Hold cover over flame for a few seconds.
  - Take glass away but leave candle burning.
3. Ask students to look at the glass and describe what they see.
  - Explain that as the candle burned, it released gases and small particles of the burned wax into the air.
  - The particles were not visible until they collected on the glass.

### *Follow-Up*

1. Show pictures of horse drawn carriages, gas guzzling cars of the 70's and electric cars that are just being introduced to the public.
2. Discuss why some industries use a less efficient and less costly means of burning pollutants. Better filtration could and should be used with these factories, instead of cutting costs.

## Grades:

K-2

## Subjects:

Science, Related Arts

## Time Needed:

45 minutes

## Materials:

candle  
match  
white or clear heat-resistant glass cover  
copy of Pollution Puzzler (included)

3. Discuss the “Clean Air Act.” How do students feel about the government regulating the free enterprise economy to save our ozone?
4. Discuss what will happen to our air if air pollution increases?

### **EXTENSIONS:**

1. Allow students to make puzzles from their Pollution Puzzlers.
2. Sing this song with students to the tune of “**This Land is Your Land.**”

This land is your land.  
This land is my land.  
From the Tennessee Valley.  
To Dauphin Island.  
From the Bankhead woodlands.  
To the Gulf Shores dry sands.  
This land was made for you and me.

This air is your air.  
This air is my air.  
To keep it cleaner.  
Is a job we all share.  
We need a solution.  
To stamp out pollution.  
This is a job for you and me.

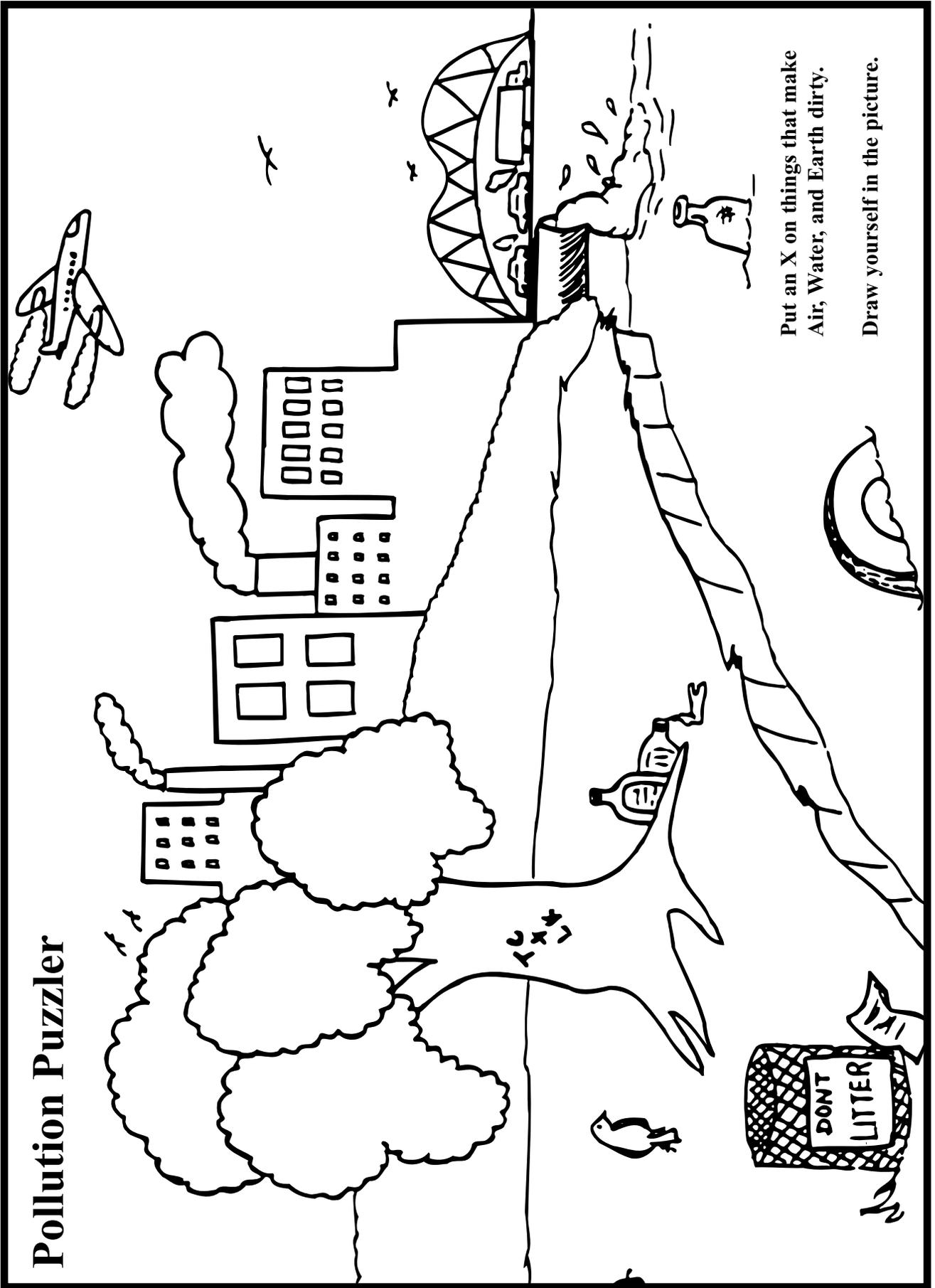
(Note: Verses can be adapted to include familiar landmarks for students)

3. Discuss where pollution comes from. Make a puff book. On each page show one thing that causes air pollution, share with class.
4. Place vaseline on an index card, hang several around the school. Check them for visible pollution in 3 days.
5. Make a graph showing ways to clean air and things that dirty our air. Correlate, read, and interpret graphs.

### **ORIGINAL DEVELOPMENT RESOURCE:**

*Pollution: Problems and solutions.* (1990). Ranger Rick’s Nature Scope. National Wildlife Federation, Washington D.C.

# Pollution Puzzler



Put an X on things that make  
Air, Water, and Earth dirty.

Draw yourself in the picture.

# Notes

## OBJECTIVES:

The student will be able to:

1. Explain that some products are harmful to people as well as the environment.
2. Discuss the problems associated with hazardous waste.

## BACKGROUND:

Hazardous waste is waste that is flammable, corrosive, unstable, or radioactive. It can also contain dangerous substances such as pesticides or lead and can be produced by industry as well as small businesses or households. This waste creates serious pollution problems. According to the Environmental Protection Agency (EPA), hazardous waste is a waste that exhibits one or more of the following characteristics:

1. Corrosivity - It is an acid or base that eats away at other things.
2. Ignitability - It can burn.
3. Toxicity - It is harmful to living organisms.
4. Reactivity - It can explode when it mixes with air, water or other chemicals.

## VOCABULARY:

**hazardous waste** - waste from chemicals that are poisonous to the environment

**radioactive** - material that can damage or destroy living cells

**toxic** - poisonous substance harmful to living organisms

## ADVANCE PREPARATION:

1. Make Mr Garbaggio
  - Open the top of the garbage can and cut a strip of cardboard as wide as the teeth will need to be. Make them long enough to fit around the front of the garbage can rim. Cut the cardboard into jagged teeth, and tape them to the inside of the rim.
  - Cover the lower part of the garbage can with a large rectangular piece of fake fur fabric. Use double stick tape or sew in place. A small hole will need to be cut where the pedal is so Mr. Garbaggio can “eat,” (Note: fake fur is optional).
  - Cut monster feet out of heavy cardboard and fur fabric. Glue the fabric to the cardboard and attach the covered cardboard feet to the bottom of the garbage can, so toes will stick out.
  - Cut out another rectangle of fur, and tape or glue it to the lid.
  - Tape or glue Styrofoam eyes to the fabric. Make sure they are secured to the fabric backing. Glue paper eyes to the

## Grades:

K-2

## Subjects:

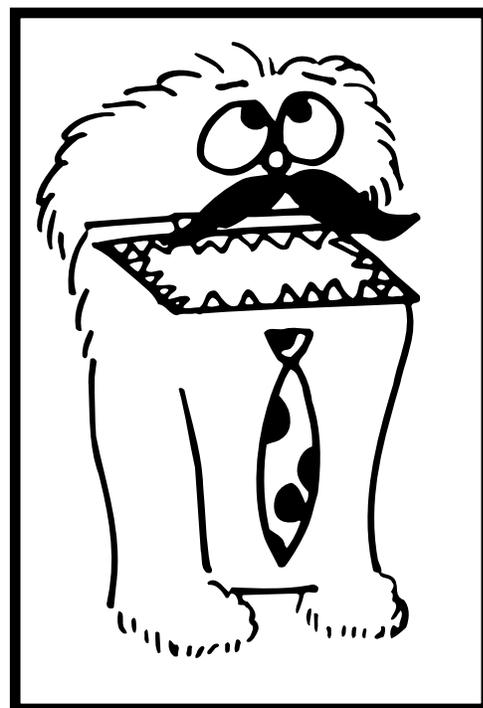
Science, Language Arts, Related Arts

## Time Needed:

30 minutes

## Materials:

one garbage can with foot pedal  
lightweight cardboard or oak tag  
masking tape, double stick tape, or a  
needle and thread  
heavy cardboard  
pieces of fur fabric  
straight pins  
two Styrofoam balls (for eyes)  
two black felt circles (for pupils)  
round object for nose  
pictures of hazardous products  
empty cleaning cans



eyeballs.

- Glue or sew on nose.

(Note: Other accessories may be added such as a moustache, feathers for hair and funny tie.)

2. Make cabinet from cardboard box.
3. Prepare pictures of various household hazardous substances and place in cabinet.  
(Refer to the definition in background of hazardous substance when selecting pictures. Examples: drain cleaners, toilet bowl cleaners, oven cleaners, batteries, motor oil, antifreeze, mothballs, bleach, paint, bugspray)

## **PROCEDURE:**

### *Setting the stage*

1. Discuss the term hazardous.
  - Define
  - Discuss products that may be hazardous to the environment.
2. Introduce Mr. Garbaggio. Explain to students that Mr. Garbaggio has a story to share with them.

### *Activities*

1. Teacher and Mr. Garbaggio will perform play, “Hazards at Home”

### *Follow-Up*

1. Discuss reasons hazardous materials are harmful to the environment.
2. Discuss ways to avoid using hazardous products.
3. Use Mr. Garbaggio in the classroom as the class mascot. Write Mr. Garbaggio letters. Tell him about your concerns for the environment.
4. Work in cooperative groups to formulate questions about the environment. Groups can change questions and research the answers.

## **EXTENSIONS:**

1. Teacher and students could make nontoxic cleaning substances to be used at school. Use baking soda and water, Bon Ami, or products available from a local grocery store.
2. Allow students to dictate or write letters to a local company that produces hazardous waste. Concerns may include how the company treats, stores, and disposes of its toxic waste. Send letters in one large envelope to save paper and postage fees.
3. Warm up math exercise. Students learn to distinguish environmentally safe cleaning products from products that can be harmful to our planet. Place 8 to 10 products on table. Use both environmentally unsafe as well as safe biodegradable products (i.e. Safe: Baking soda, vinegar, lemons. Unsafe: chlorine bleach, flammable cans under pressure) Have students feed Mr. Garbaggio the safe products and discard the harmful products to the side. Let students count the difference.

## **ORIGINAL DEVELOPMENT RESOURCES:**

Environmental Protection Agency (EPA, 401 M St., SW, Washington, D.C. 20460). [www.epa.gov](http://www.epa.gov)

Henson, C. (1994). *The muppets make puppets!* New York, NY: Workman Publishing.

“Household Hazardous Waste Wheel.” Legacy, Inc. P.O. Box 3813, Montgomery, AL 36109, [www.legacyenvd.org](http://www.legacyenvd.org), 1-800-240-5115.

## **ADDITIONAL RESOURCES:**

[http://dnr.wi.gov/org/caer/ce/eek/teacher/groundwaterguide/This\\_Product\\_May\\_be\\_hazardous\\_activity.pdf](http://dnr.wi.gov/org/caer/ce/eek/teacher/groundwaterguide/This_Product_May_be_hazardous_activity.pdf)

# Hazards At Home

**Teacher:** Hi, Mr. Garbaggio ! How are you?

**Mr. Garbaggio:** Funny you should ask. I had to go to the hospital last week. My stomach still doesn't feel very good.

**Teacher::** Too much candy again, Mr. Garbaggio?

**Mr. Garbaggio:** Not exactly. I was looking for something to eat like I usually do, and I found something that looked pretty good. So I put it in my mouth, and all of a sudden what I ate made me sick ! I still have to eat special foods. At the hospital, they told me there are a lot of things in my house that are dangerous to eat, smell, and touch.

**Teacher:** Really? (Look in the cupboard, a cardboard box with a door, and pull out pictures representing various household hazardous substances. For each item, ask the students what it is used for and whether or not it is hazardous. Rephrase the question by interchanging the words: hazardous, poisonous, toxic, harmful, could make you sick. Emphasize that children should never taste, touch, or smell these hazardous substances.)

**Teacher:** There are a lot of things toxic at my house, too. If these things can make me sick, then I don't want them in my house. (Start to throw the hazardous materials into Mr. Garbaggio.)

**Mr. Garbaggio:** Don't throw them in here ! These things are dangerous to me and if they are thrown into the trash they may get buried at the landfill. Rainwater can run through them and carry the poisons into our drinking water, or an animal could eat them.

**Teacher::** Okay, I'll pour them down the sink instead.

**Mr. Garbaggio:** Don't do that ! If you pour them down the sink, they will go to the treatment plant where they try to clean the water. These poisons can't be cleaned very well so they'll end up in the rivers or lakes.

**Teacher:** The river? That could hurt a number of my friends who live there if they were to drink the water. Let's see, there are the Scales, a fish family, and the Quacks - you know that nice family of ducks and their cousins from Canada, the Honkers. (To students) Do you know anyone who drinks water from the river? Okay Mr. Garbaggio, I won't pour them down the drain. But what can I do?

**Mr. Garbaggio:** Have your parents save these items in a safe place until your town has a hazardous waste collection day. Or call your local officials and find out the proper way to get rid of waste in your area. Then your parents can take it where other people will carefully collect the poisonous materials in special containers and take them away to places where they can be thrown away safely. Some can be burned in special ovens. Others, like used motor oil, can be made into new oil.

**Teacher:** You mean recycled?

**Mr. Garbaggio:** You bet !

**Teacher:** That sure sounds better than putting these harmful things in the water.

**Mr. Garbaggio:** It sure is, but do you know the best thing you can do?

**Teacher:** What's that?

**Mr. Garbaggio:** Find other things to use in place of these toxic materials. There are lots of things you can use to clean with that are not hazardous. I make up a mixture of soapy water to kill the bugs on plants and use baking soda and water to clean the oven. Then no one has to worry, not the Scales, the Quacks, not you and not me !

**Teacher:** Thanks for telling what to do about toxins, Mr. Garbaggio. But next time you want to learn something, please ask somebody about it. Don't just eat anything you find around your house. Promise?

**Mr. Garbaggio:** I promise.

The End.

# Notes

## OBJECTIVES:

The student will be able to:

1. Identify different types of noise pollution.
2. Offer solutions to noise pollution.

## BACKGROUND:

How serious is urban pollution? Urban dwellers are subjected to excessive noise. According to the US EPA, nearly half of all Americans, mostly urban residents, are regularly exposed to noise pollution- any unwanted, disturbing, or harmful sound that impairs or interferes with hearing, causes stress, hampers concentration and work efficiency, or causes accidents. Noise is the country's most widespread occupational hazard. About 9 million workers in the US are exposed to potentially hazardous levels of noise. Millions of people damage their hearing by listening to loud music using home and car stereos (boom cars), and portable stereos (boom boxes) held close to the ear. Using earphones can also damaging hearing.

Harmful effects from prolonged exposure to excessive noise include permanent hearing loss, high blood pressure (hypertension), muscle tension, migraine headaches, higher cholesterol levels, gastric ulcers, irritability, insomnia, and psychological disorders, including increased aggression.

## VOCABULARY:

**noise pollution** - sound that is annoying and may cause hearing loss

## PROCEDURE:

### *Setting the Stage*

1. Discuss the term "noise pollution" with students.
2. Explain that some noise pollution, such as noise from airplanes, TVs, and stereo equipment can be damaging to our hearing.

### *Activities*

1. Have students make a list of ten noises they hear on their way home from school and at night. Have them bring their list to school the next day. (Note: Students may use a tape recorder to record sounds.) List the sounds on the quiet and loud sheet.
2. Identify the noise and loudness level of each item on the sheet.
3. Discuss ways to reduce the amount of noise pollution we are exposed to.
  - turning down volume of car stereos
  - recognizing cars without mufflers
  - using loud motorized devices only during daylight (leaf blower, lawn mowers)
  - muting the sound of loud musical instrument (rubber pads on drums, using headphones with electric guitars and synthesizer).
4. Work in groups: Fill out your plan for decreasing noise pollution in your area.

## Grades:

K-2

## Subjects:

Science, Language Arts, Social Studies

## Time Needed:

15 minutes initially  
25 minutes follow up

## Materials:

pencil  
paper  
tape recorder (optional)

*Follow-Up*

1. Students should distinguish between noise that people can control and those that cannot be controlled.
2. Allow students to design a plan for decreasing noise pollution in the area.

**EXTENSIONS:**

1. Recordings can be made of different sounds. Students can listen to recordings and try to guess what the sounds are. This could be done as a group activity or set up at a listening center.
2. Cameras or pictures from magazines can be used along with the recordings of sounds. Students can match the pictures to the sounds on the recordings. A map of the area where the sounds were recorded can also be constructed with the photographs.

**ORIGINAL DEVELOPMENT RESOURCES:**

Commins, E. (1982). *Early childhood activities*. Atlanta, GA: Humanities Limited.

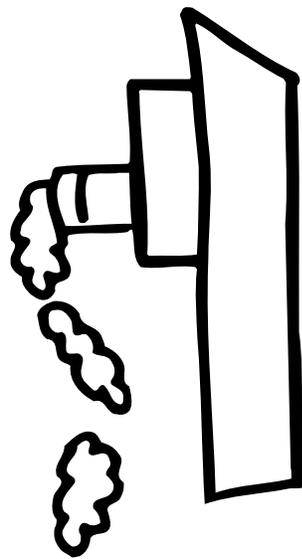
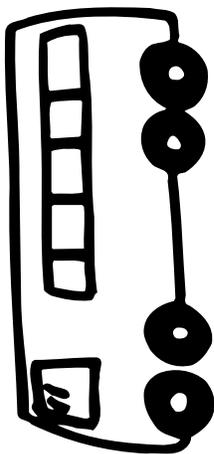
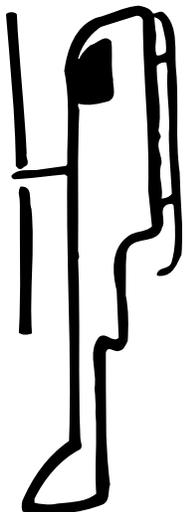
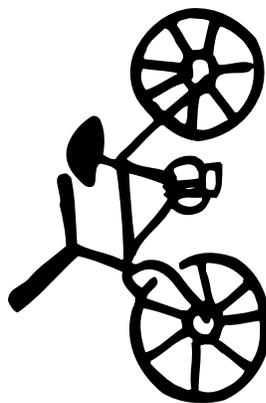
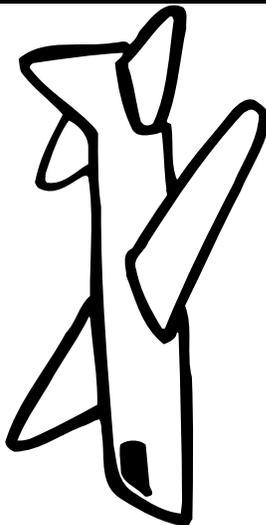
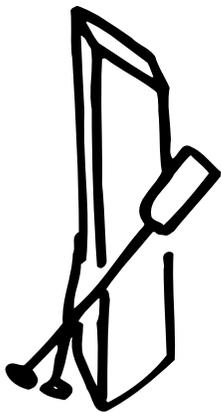
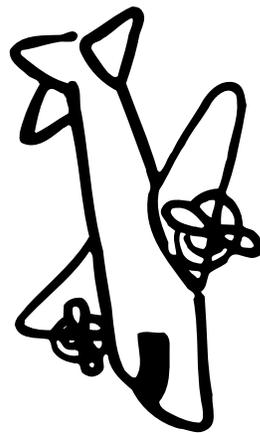
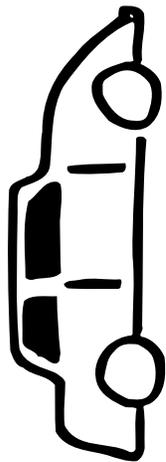
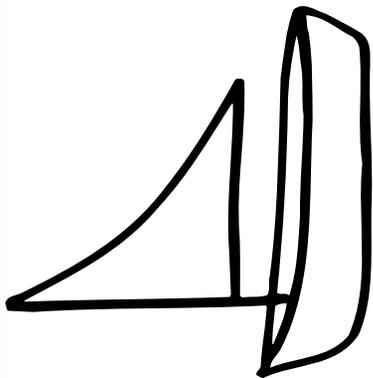
Miller, E.T. (1998). *Living in the environment*. Belmont, CA: Wadsworth Publishing Company.



**Quiet**



**Loud**



## OBJECTIVES:

The student will be able to:

1. Explain their personal responsibility to the Earth.
2. Become a spokesperson for chosen topics.
3. Give persuasive speeches in front of class.

## BACKGROUND:

In *The Lorax*, a small boy listens as the old Once-ler recalls how the rare Truffula Trees become extinct. He tells how the Lorax spoke for the trees and the animals until the last Truffula Tree was chopped down. The only creature that remains is the Once-ler. After the story of the Lorax is told, the Once-ler gives the last Truffula Tree seed to the boy. He asks the boy to plant it, protect it, and grow a forest so that the Lorax and all of this friends will come back.

## VOCABULARY:

**greenhouse effect** - accumulation of heat in the lower atmosphere through the absorption of longwave radiation from the earth's surface.

## ADVANCE PREPARATION:

Locate and read *The Lorax* by Dr. Seuss.

## PROCEDURE:

### *Setting the Stage*

Begin a discussion with students by asking this question, "What would happen if all the trees in the world were cut down?" (Discuss the decrease in oxygen, the increase in the "green house" effect due to increased carbon dioxide, the lack of paper and wood products, no homes for many animals, less fruits and nuts.)

### *Activities*

1. Read *The Lorax* by Dr. Seuss.
2. Have students follow the example of the Lorax who was the only one to speak for the trees.
  - Students can develop or write short persuasive talks to speak for the trees, the oceans, and the whales.
  - Students may select their own topics, or the teacher can assign topics. (Note: Students may work individually or in small groups.)
  - Visual aids can also be made by the students to be included in speeches.

### *Follow-Up*

Students will give their persuasive speeches in class. (If students are working in groups, each member of the group should have a turn speaking, if desired.)

## EXTENSIONS:

1. Student speeches may be recorded using audio or video tapes and played back in a listening center.
2. Students can use old T-shirts and fabric paint to create wearable art that sends an environmental message.
3. Get permission from Creative Publications to write a (school) script from *The Lorax* and perform a play or skit for others in the school.

## Grades:

K-2

## Subjects:

Science, Language Arts

## Time Needed:

60 minutes

## Materials:

*The Lorax* by Dr. Seuss  
materials for student to create visual aids

4. Refer to “Who Needs a Tree” in Learning Through Legacy (K-2).
5. Refer to “The Gift of the Tree” in Learning Through Legacy (K-2).

**ORIGINAL DEVELOPMENT RESOURCES:**

Dr. Seuss. (1971). *The lorax*. New York, NY: Random House.

# INTRODUCTION TO WASTE MANAGEMENT

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## **Municipal Solid Waste Management**

Waste Management in Alabama is as diverse as the state's natural resources. Municipal solid wastes are generated in homes, commercial establishments, institutions, and industries. Municipal solid waste varies from yard waste to food scraps and from construction and demolition debris to office and classroom paper. In the United States, each individual produces 2,555 pounds of garbage each year. In Alabama, each individual produces approximately 4.5 pounds of municipal solid waste a day. Local governments, waste management companies, and consumers have established methods of disposing of waste in an environmentally friendly manner.

*Recycling* is the process by which used items are reconditioned and are adapted to a new use or function. Recycling is a waste management method that can be a responsible, cost-effective way to help solve some of Alabama's waste disposal problems. Recycling helps preserve natural resources, reduce pollution, and save energy.

*Composting* is a low-cost disposal method whereby organic material is accumulated in mounds or containers to bring about decomposition by microorganisms such as bacteria or fungi. Composted items can be used as a soil conditioner in landscaping and gardening.

*Incineration* is a disposal method involving the burning of solid waste to reduce volume, with or without the recovery of energy.

*Landfilling* is the major disposal method of solid waste in Alabama. A landfill is a system of trash and garbage disposal in which waste is buried between layers of earth in such a manner that minimizes environmental hazards. New EPA regulations called subtitle D make landfilling more environmentally friendly than before, but much more expensive.

## **Hazardous Waste Management**

In addition to municipal waste management, Alabama also must manage hazardous wastes produced in the state. *Hazardous waste* is any solid, liquid, or gaseous material that is no longer of use in its present form and would cause injury or death to living organisms and would pollute land, air, or water if improperly disposed. Some examples of hazardous wastes include oil, batteries, pesticides, and oil paints. Hazardous wastes may be managed through minimization, resource recovery such as recycling or reuse, treatment, or disposal.

The *Resource Conservation and Recovery Act* (RCRA) classifies hazardous waste into two categories: characteristic hazardous waste and listed hazardous waste. *Characteristic hazardous wastes* exhibit one or more of the following traits: ignitability, corrosivity, reactivity, or toxicity. *Listed hazardous wastes* are incorporated into lists from the RCRA rules. They exhibit one of the previously listed characteristics or contain any number of toxic constituents that have been shown to be harmful to health and the environment.

Household hazardous waste, unlike hazardous waste generated by industry, is not regulated in Alabama by the Alabama Department of Environmental Management or the U.S. Environmental Protection Agency. The best way to manage household hazardous waste is to avoid generating hazardous products.

Disposal may be reduced or eliminated by giving leftover products away, recycling materials when possible, using less hazardous alternatives when possible, and buying only the amounts of products needed.



## OBJECTIVES:

The student will be able to:

1. Identify three categories of trash: recyclables, biodegradables, and disposables.
2. Classify into these three categories.

## BACKGROUND:

Our solid waste problem is very complex. To solve this problem, each community must look at all possible solutions and make a comprehensive solid waste plan. These plans may include reduction, recycling, composting, incineration, and landfilling. No single method will solve the problem; therefore, each community has to decide which alternatives best meet the local needs.

We are all garbage producers and, therefore, are part of the problem. We must also all be part of the solution.

## VOCABULARY:

**biodegradables** - materials that can be broken down naturally

**disposables** - products designed to be thrown away after use; will be incinerated or sent to a landfill

**recyclables** - useful materials taken from garbage or waste that are used again or reprocessed

**source reduction** - to use less to begin with at the place where waste is produced

## ADVANCE PREPARATION:

Collect the household trash accumulated in one day.

## PROCEDURE:

### *Setting the Stage*

Discuss the amount of trash generated each day at each student's home 365 days a year. Weigh the bag from one day's worth of household trash and multiply it by 365 to impress upon students how much garbage comes from one family.

### *Activities*

1. Divide students into three equal teams. They will represent three categories of trash: Recyclables, Biodegradables, Disposables.
2. One student from each team goes through the household trash and selects an item belonging to his category and places the item in the correct container. Each student on the team repeats this activity. (Be sure students wear plastic gloves.)

### *Follow-Up*

1. Discuss ways in which these items can be reused or recycled.
2. Discuss the biodegradable items and explain how they can rot or decompose over a period of time.
3. Discuss the leftover items that cannot be recycled or cannot decay. How are these items disposed of in the community?
4. Discuss ways in which source reduction may be applied to eliminate these wastes in the first place.

## Grades:

K-2

## Subjects:

Science, Social Studies

## Time Needed:

30 minutes

## Materials:

one day's worth of household trash

three boxes or trash cans labeled:

Recyclables

Biodegradables

Disposables

one box of plastic gloves

## **EXTENSIONS:**

1. In a small plot on the campus, bury samples of biodegradable trash. Unearth the trash periodically to see what is happening. Record the observations. Refer to “Mini-Landfill” in Learning Through Legacy (K-2).
2. Contact a local recycling agency to set up a field trip or have a resource person visit the class and discuss the recycling operation.
3. Have students and their parents graph their trash items into the three categories for a period of one week. Identify what types of trash are most common. Have students develop a reduction plan for their family.
4. Refer to “Garbage Pizza” in Learning Through Legacy (K-2).

## **ORIGINAL DEVELOPMENT RESOURCE:**

Goodman, B. (1990). *A kid's guide to how to save the planet*. New York, NY: Byron Preiss Publications, Inc.

## OBJECTIVES:

The student will be able to:

1. Describe the composition of landfills.
2. Classify waste into each category.
3. Observe the amount of waste in each category.

## BACKGROUND:

The average household in Alabama disposes of about 100 pounds of garbage per week. This trash is made up of an assortment of paper products, food waste, glass, metal, plastic, wood, and yard waste. Unless some of it is reused or recycled, the trash is picked up by garbage trucks and transported to a community landfill.

In many parts of the state, waste collected from homes, transfer stations, and greenboxes is compacted (compressed to make smaller). This helps reduce the amount of space that waste takes up in a landfill. Currently about 80 percent of Alabama's solid waste goes to landfills.

## VOCABULARY:

**landfill** - a large outdoor area designed for waste disposal; sanitary landfills are lined with plastic and covered daily with earth to prevent garbage from polluting surrounding land and water

**collection station** - a facility where recyclables are collected and processed for the market

**transfer station** - a facility where garbage is collected before being taken to the landfill

## ADVANCE PREPARATION:

Gather materials and supplies.

## PROCEDURE:

### *Setting the Stage*

Draw a circle on the board. Explain that we are going to pretend that all waste thrown away in the United States will fit into this circle. Copy the illustration included onto the circle. Point out that some slices are larger than others. Reinforce the fact that the largest slice for paper means there are more paper products sent to the landfill than any other category, followed by yard waste and so on.

### *Activities*

#### *First Period*

1. To make a garbage pizza, begin by making crust. This can be done by combining corn starch and school glue until they form a dough consistency.
2. Flatten dough onto waxed paper over a pizza pan or 12" cardboard circle.
3. Cut the pizza into sections as shown on the board.
4. Separate the sections or use a ready-made crust purchased at a local grocery store.

## Grades:

K-2

## Subject:

Science

## Time Needed:

two 30-minute classes

## Materials:

mixing bowl  
spoon

pizza pan  
paint brushes

corn starch  
red food coloring

waste items in these categories:

paper  
yard waste  
metals  
glass  
wood  
food waste  
plastic  
misc. waste

### *Second Period*

1. Mix glue with red food coloring until there is a tomato-sauce look.
2. Divide slices and apply sauce with paint brushes.
3. Glue collected toppings onto corresponding slices. Some of the items needed for toppings are shredded paper, wrappers, boxes, grass clippings, sticks, leaves, paper clips, staples, can, lids, marbles, egg shells, pasta, Styrofoam cups, plastic utensils, rubber bands, candles, or pieces of fabric.

### *Follow-Up*

1. Have students use magazine pictures to construct another garbage pizza on poster board.
2. Contact local waste management authorities to locate information concerning the amount and type of garbage disposed of in the area. Construct a circle or bar graph of this. On average, how much money is saved through recycling, reusing, reducing?
3. Have students draw the sequence of trash from stores, to their homes, to the landfill. They may then write or dictate sentences to accompany their illustrations.

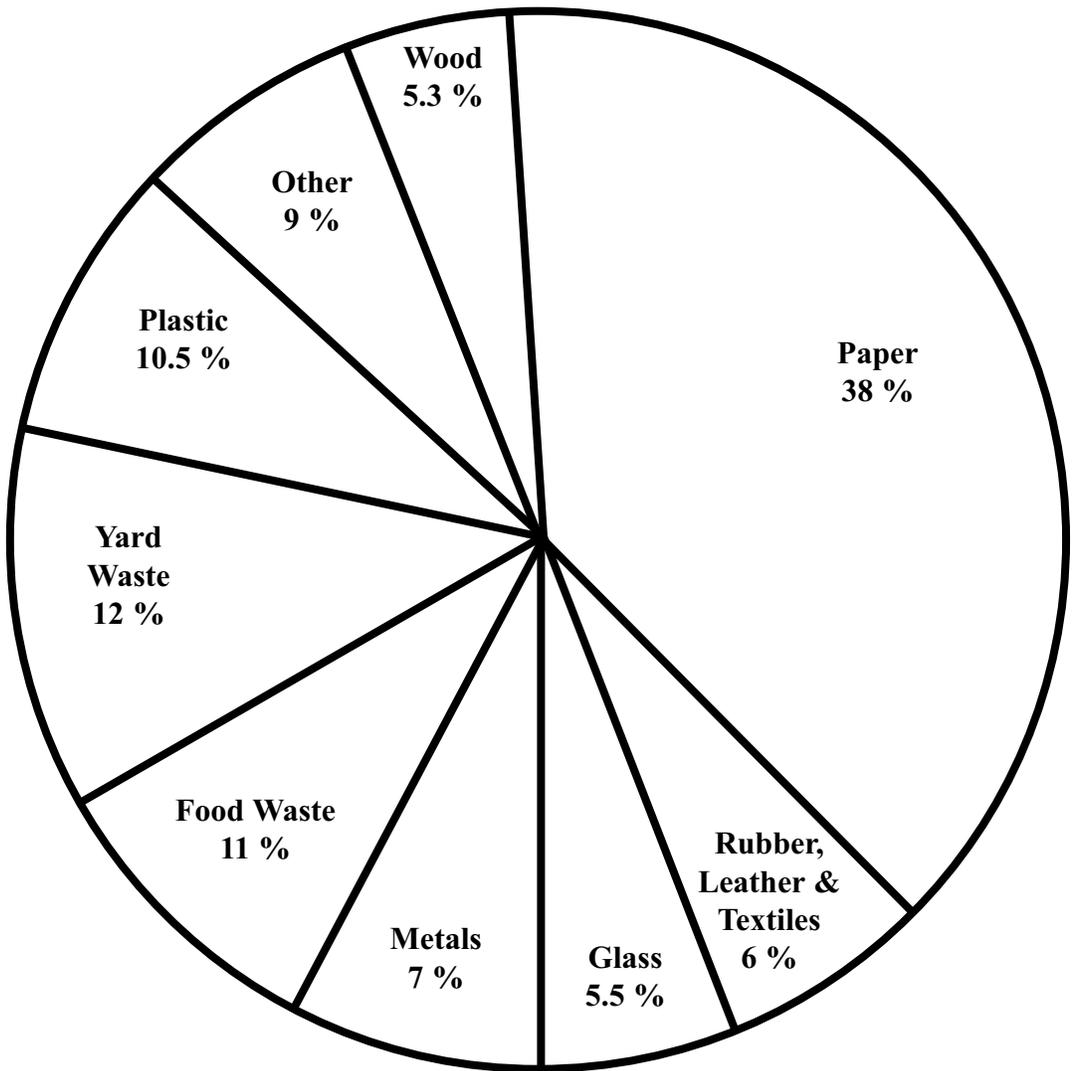
### **EXTENSIONS:**

1. Plan a classroom project to reduce the amount of wasted paper. Students can reduce paper waste by using both sides of paper. Have a reuse paper box in the room and find out if the school purchases products made of recycled paper. Set up a special can for collecting aluminum cans if the school has drink machines on campus.
2. Refer to "What is Trash?" in Learning Through Legacy (K-2).

### **ORIGINAL DEVELOPMENT RESOURCES:**

Auburn Cooperative Extension, *Keep America Beautiful*, (1990), p. 49.

# Garbage Pizza



# Notes

## OBJECTIVES:

The student will be able to:

1. Identify what resources are used to produce the mail.
2. Learn what happens to junk mail in the home.
3. Graph types of junk mail.

## BACKGROUND:

Each day Alabama households, along with millions of other American homes, receive an enormous amount of junk mail that must eventually be disposed of. Paper products account for over one-third of the solid waste in our country. It is important that students develop an awareness of how much paper waste is needlessly generated and understand how individual people can be a part of the solution to this problem.

## VOCABULARY:

**junk mail** - mail received that is unwanted by the occupant

**solid waste** - any discarded material that is not liquid or gas

**dispose** - to get rid of, or throw away

## ADVANCE PREPARATION:

1. Collect a week of junk mail received at home and at school.
2. Prepare a poster board, a graph chart, or a floor graph using a plastic shower curtain and colored tape. Lay it out and label four categories: coupons, advertisements, political, sale merchandise. Divide each category line into equal spaces to form a bar graph. (A floor graph is a recycled teaching aid. It can be relabeled and used again and again.)

## PROCEDURE:

### *Setting the Stage*

Begin by telling students that most homes receive large amounts of unsolicited and unwanted mail every year. This mail costs millions of dollars and wastes valuable resources. Much of this junk mail ends up as litter or in landfills. Show the bag of junk mail that has been collected in a week. Have them imagine how much junk mail comes to each family in the room or have them actually collect the junk mail their family receives for one week.

### *Activities*

1. Students will organize junk mail into categories: coupons, advertisements, political, sale merchandise.
2. Next, students will graph the types of junk mail either as a cooperative group or as a whole group. As students categorize mail, place each piece in the correct category.
3. Identify which type of junk mail was received most often. Which type was least often received?

### *Follow-Up*

1. Examine the junk mail and look for toll-free numbers or addresses to request that your name be removed from the mailing list. One resource that students can use is a no-charge service that removes names from many national mailing lists. Visit their website at <http://www.dmachoice.org>. You may want to share this information with the students' parents.
2. Have students draft a letter requesting that names of adults in their household are removed from a mailing

## Grades:

K-2

## Subjects:

Science, Art, Math

## Time Needed:

30 minutes

## Materials:

junk mail

glue

scissors

poster board, graph chart, or floor

graph

- list. (Be sure students don't mail this letter unless the adults have approved it.)
3. Have students brainstorm and list other uses of junk mail around the house.

### **EXTENSIONS:**

1. Students can use the junk mail and construct an airplane. Have a Junk Mail Airplane contest. Some categories might be most original or neatest. You might want to have a distance contest to determine the airplane that can fly the farthest.
2. Students might collect junk mail at their own homes and make Junk Mail Graphs for their household. Students could then bring these to class to share and compare. Discuss why different families receive different junk mail.

### **ORIGINAL DEVELOPMENT RESOURCES:**

Spendlove, D. (1993). *Explorer home*. Lewiston, UT.

## OBJECTIVES:

The student will be able to:

1. Identify products that are over-packaged.
2. Compare the amount of packaging for different products.
3. Identify products using the least amount of packaging to protect the item.

## BACKGROUND:

As much as 40 percent of household waste (what we throw away at home) is packaging. Packaging of some kind is necessary in many cases to protect food and keep it clean and free from germs. However, many layers of paper and plastic packaging often add unnecessarily to the waste stream and are not recyclable. For instance, paper packaging coated with plastic or aluminum prevents it from being recycled. It is difficult to be aware of how much waste we produce, especially when we throw out one candy wrapper at a time. But many little pieces quickly add up to a surprisingly large amount.

## VOCABULARY:

**packaging** - the wrapper or container covering many items for sale

**products** - something produced by nature or by people that is used

**bulk buying** - purchasing a particular item in large quantities

**recycling** - reprocessing of discarded materials into new, useful products; not the same as reuse of materials for their original purpose, but the terms are often used interchangeably

## ADVANCE PREPARATION:

Purchase several items that are over-packaged. For example, deodorant in boxes, frozen dinners in a plastic dish with a plastic cover in a box, vegetables in a plastic tray covered with plastic wrap.

## PROCEDURE:

### *Setting the Stage*

Unwrap each product. Have the students identify each of the materials. Ask them how else these products could be packaged to save materials. Identify which materials can be recycled.

### *Activities*

Students will work in cooperative groups.

1. All groups can work with the same product, or each group may choose a different product such as gum, Lifesavers, or snack foods.
2. Ask each group to unwrap the product carefully, saving all the packaging.
3. Weigh the pile of packaging. Next weigh the product. Which weighs more?
4. Ask, "Why are there so many wrappers?" List on board possible purposes for each wrapper. "How would you package this product?"

### **Grades:**

K-2

### **Subjects:**

Science, Math

### **Time Needed:**

30 minutes

### **Materials:**

scale balance

packaged products, gum, snack food

*Follow-Up*

1. Ask students to identify the raw products or natural resources used in the packaging.
2. Ask students to list products their families purchase that are over-packaged.
3. Discuss “bulk” buying and how this can reduce waste.

**EXTENSIONS:**

1. Compare how similar products are packaged in other countries. (This will take some research work.)
2. Discuss how materials were “packaged” 100 years ago in a general store. Would this work today? Why or why not?

**ORIGINAL DEVELOPMENT RESOURCES:**

Foster, J. (1991). *Cartons, cans and orange peels: Where does your garbage go*. New York, NY: Clarion Books.

## OBJECTIVES:

The student will be able to:

1. Classify items into groups.
2. Gain an appreciation of poetry.
3. List major food groups.

## BACKGROUND:

When you throw away in Alabama, there are several options for disposal. Composting is a low-cost disposal method whereby organic material is accumulated to bring about decomposition by micro-organisms. Items that contain fat, such as meat scraps or dairy products, should not be composted. Other items may be recycled, thus reducing the amount of garbage. Some items cannot be classified in either category and, therefore, must be disposed of. Students, as well as adults, must realize composting and recycling can reduce landfill waste considerably.

## VOCABULARY:

**compost** - a mixture of plant and food waste used to fertilize the soil

**trash** - waste that is of no use and should be disposed of in a landfill

**biodegradable** - waste that can be decomposed by bacterial action

**dispose** - to get rid of, or throw away

**waste** - that which is no longer wanted

**decompose** - to decay or rot from a process of microbial action

**micro-organism** - plant or vegetable organism too small to be seen without a microscope

**landfill** - a large outdoor area designed for waste disposal; sanitary landfills are lined with plastic and covered daily with dirt to prevent garbage from polluting surrounding land and water

## ADVANCE PREPARATION:

1. Obtain a copy of “Sarah Cynthia Sylvia Stout Would Not Take the Garbage Out” by Shel Silverstein.
2. Make student copies of classifying sheets.
3. Obtain a USDA MyPlate graphic.

## PROCEDURE:

### *Setting the Stage*

1. Discuss with class how many different food groups there are at each meal using MyPlate. Find updated guidelines at <http://www.choosemyplate.gov>.
2. Discuss with students the amount of waste left after each meal.

### *Activities*

1. Have students classify items into major food groups: Bread/Cereal, Fruit/Vegetable, Meat, Dairy. This can be a whole group activity or done individually. Provide students with a MyPlate graphic.
2. Read Shel Silverstein’s poem “Sarah Cynthia Sylvia Stout Would Not Take the Garbage Out.” Point out that most items in the poem are biodegradable.

## Grades:

K-2

## Subjects:

Science, Health, Math, Language Arts

## Time Needed:

60 minutes

## Materials:

copy of poem, “Sarah Cynthia Sylvia Stout Would Not Take The Garbage Out” from *Where the Sidewalk Ends* by Shel Silverstein  
MyPlate graphic

3. Have students classify items into method of disposal. (See: “Help Sarah Take Her Garbage Out” student activity page.)
4. Graph the results and interpret the graph.
5. Compare with MyPlate.

*Follow-Up*

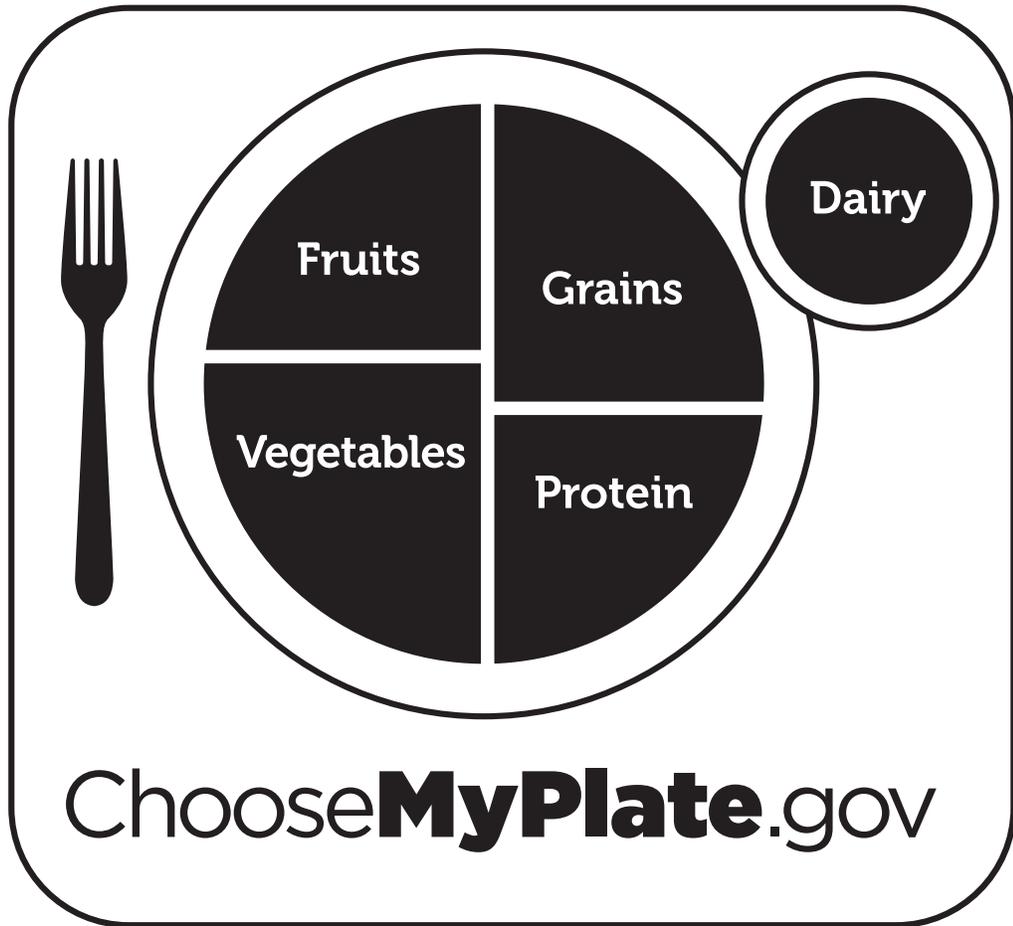
Have students record items disposed of from their evening meal and classify into correct food group. See Meal Time Breakdown and trash disposal categories.

**EXTENSION:**

Have class dispose of lunch waste into three buckets or containers using these categories: Compost, Trash, Animal Food. Before lunch have students predict which container will have the most and the least.

**ORIGINAL DEVELOPMENT RESOURCES:**

Silverstein, S. (1974). Sarah Cynthia Sylvia Stout would not take the garbage out. *Where the sidewalk ends*. New York, NY: Harper & Row, Publishers, Inc. pp. 70-71.



# Help Sarah Take Her Garbage OUT !

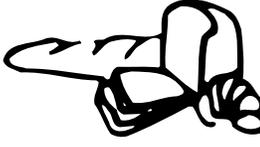
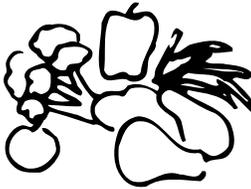
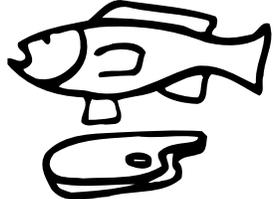
Compost

Trash

Animal Food

Compost	Trash	Animal Food

# Meal Time Breakdown

 <b>Grain</b>	 <b>Dairy</b>	 <b>Fruits &amp; Vegetables</b>	 <b>Meat (Protein)</b>

# Notes

## OBJECTIVES:

The student will be able to:

1. Explain that some materials can be made smaller to make less solid waste.
2. Demonstrate the concept of reduction.
3. Compare and contrast between objects.

## BACKGROUND:

Trash items do not just go away or disappear. There is no place on Earth called “away.” Things we think we throw “away” have to go somewhere, and these things end up in the soil, air, streams, and oceans. Reusing and recycling goods such as paper, aluminum cans, glass jars and plastics can reduce the amount of solid waste that we throw away. It is up to all of us to be aware of the amount of garbage we produce and take steps to ensure we lower this amount.

## VOCABULARY:

**reduce** - to make smaller in any way such as size and weight.

## ADVANCE PREPARATION:

Gather materials and supplies.

## PROCEDURE:

### *Setting the Stage*

Blow up a balloon and release the air. Did the balloon become smaller? Was it reduced? What happened to make the balloon smaller? Discuss the concept of reduction as it relates to waste. Remind the students that there is still a balloon even though it is smaller.

### *Activity*

Compare a two-quart package of pre-sweetened powdered drink mix to a two-quart container full of a drink.

1. Mix powdered drink mix with water in a reusable pitcher.
2. Consume both drinks.
3. Compare the waste from the powdered drink mix (packet) and the two-quart container.
4. Also discuss if either of these products is necessary. Ask the students: Do you need the drink mix or is water acceptable sometimes, too?

### *Follow-Up*

1. Have students make a waste reduction shopping list. List common items purchased each week and give waste reduction suggestions for each item.
2. Have students identify specific products with reusable containers that have refills that may be purchased in smaller containers.
3. Discuss what will happen to our earth if we don't begin to reduce.

## Grades:

K-2

## Subjects:

Science, Math

## Time Needed:

30 minutes

## Materials:

balloons  
two-quart beverage  
two-quart powdered drink mix  
pitcher  
spoon to mix  
equal arm balance  
two empty 8-ounce cans  
one empty 16-ounce can

## **EXTENSIONS:**

1. Demonstrate that purchasing large containers reduces waste. Use an equal arm balance and compare the weight of two empty eight-ounce cans with one empty 16-ounce can, all made from the same material. Remind students that it takes less metal to make the 16-ounce can than two eight-ounce cans. Also it is usually cheaper in the long run to purchase the larger container.
2. Have students check at home to see what types of products the family uses to reduce waste.
3. Pour the same amount of Kool Aid into different sized and shaped containers (both reusable). Have the students guess which container holds the most liquid. Show the students that both containers hold the same amount by measuring the contents. Discuss buying the one with less waste.

## **ORIGINAL DEVELOPMENT RESOURCES:**

Goodman, B. (1990). *A kid's guide to how to save the planet*. New York, NY: Byron Preiss Publications, Inc.

## OBJECTIVES:

The student will be able to:

1. Observe and identify the difference between degradable and non-degradable wastes.
2. Understand the importance of recycling and its impact on landfills.
3. Classify garbage items as disposable, recyclable, or compostable.

## BACKGROUND:

More than 75 percent of our trash ends up in landfills. In the past, landfills were just big holes dug for burying the trash. Today's modern sanitary landfills must meet strict state and federal requirements. They are now lined with clay or plastic and then filled with garbage so that waste does not pollute nearby land and water.

## VOCABULARY:

**compostable** - organic materials that will break down or decompose naturally and can be used as an organic fertilizer to enrich the soil.

**disposables** - products designed to be thrown away after use; will be incinerated or sent to a landfill.

**landfill** - a large outdoor area designed for waste disposal. Sanitary landfills are lined with plastic and covered with earth to prevent garbage from polluting the surrounding land and water.

**recyclables** - useful materials from garbage and waste that are used again and reprocessed

**reduce** - to make smaller in any way such as size or weight

**reuse** - to use again for the same or different purpose

## ADVANCE PREPARATION:

1. Collect needed materials for making a mini landfill.
2. Collect some household garbage: kitchen scraps, newspaper, grass clippings, leaves, plastic, aluminum items, paper products, glass items.

## PROCEDURE:

### *Setting the Stage*

Lead class in a discussion of what happens to items at a landfill. Have students outline the steps of what happens to garbage from the time they dispose of it until it goes into the landfill. Let students predict what will happen to various types of items once placed in a landfill (paper, food scraps, plastic, glass, aluminum). Record these on a chart.

### *Activities*

1. Construct a mini landfill from two two-liter bottles. See diagram.

## Grades:

K-2

## Subjects:

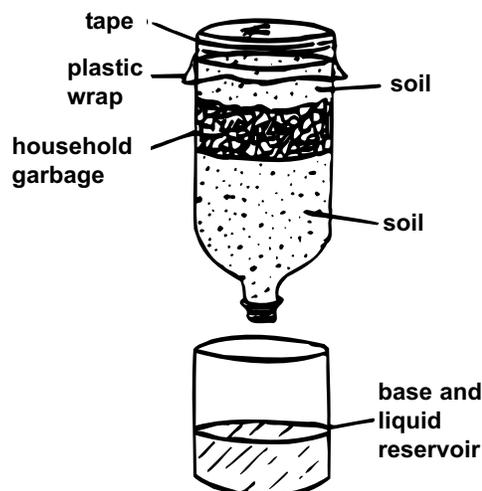
Science, Language Arts

## Time Needed:

50 minutes

## Materials:

two two-liter plastic soda bottles  
scissors  
potting soil  
household garbage



2. Cut off bottom of one bottle. Next cut top half off of other bottle to form the base and liquid reservoir.
3. Fill upper bottle about half full of soil. Add household garbage. Cover garbage with more soil. Sprinkle soil with water and cover top with plastic wrap.
4. Place the mini landfill in a warm place for ten days to a month. (Students can observe mini landfill during this time.)
5. Then empty the contents of the jar onto a newspaper and examine the garbage. Have students confirm or reject their previous predictions about each type of garbage.

#### *Follow-Up*

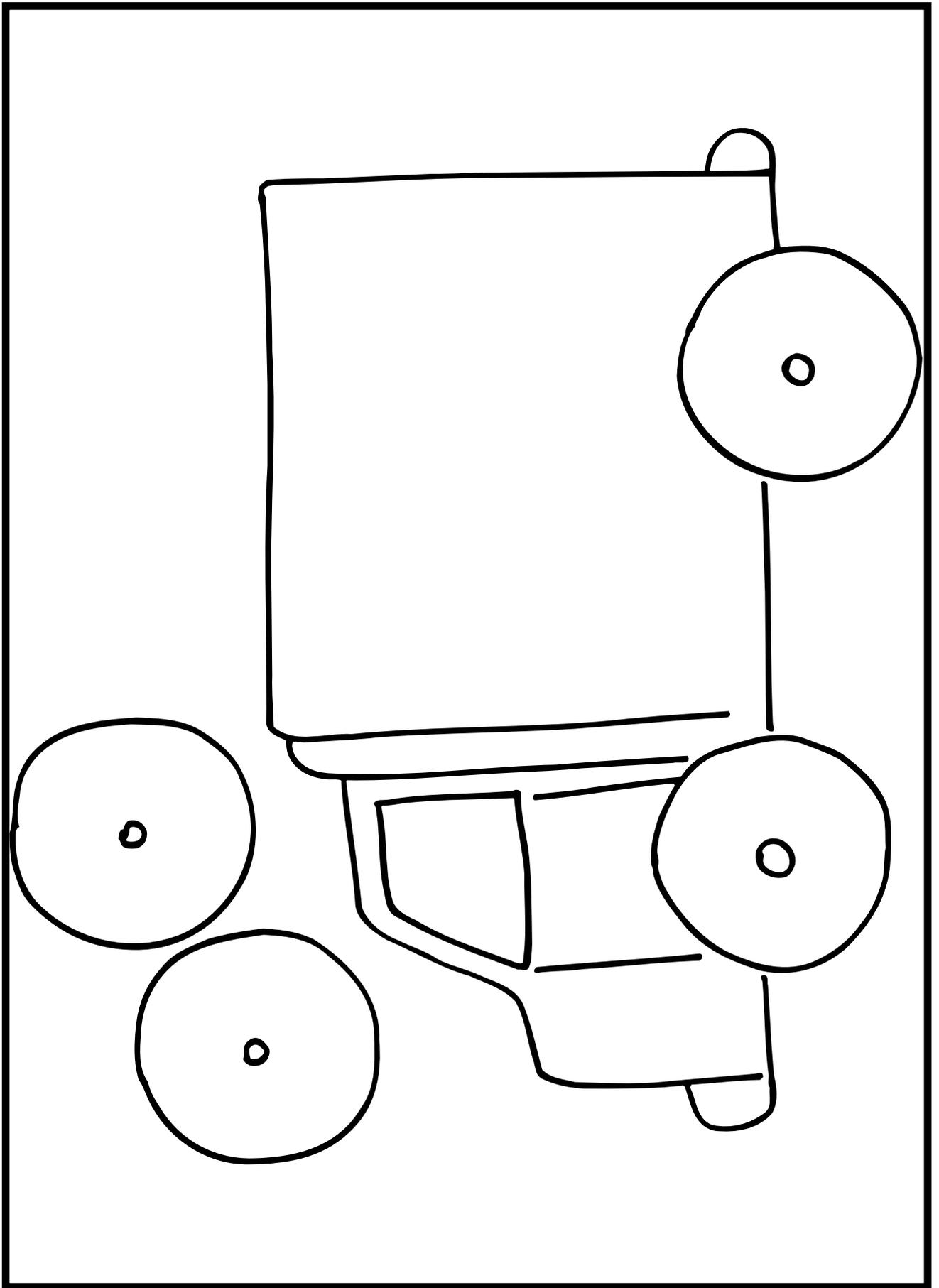
As a whole class activity, have students classify household garbage into categories of disposable, recyclable, or compostable. Identify ways people can reduce materials sent to landfills based on these categories.

### **EXTENSIONS:**

1. Test which environment is best for decomposition to take place. Take four baggies and fill each half full of soil. Then add one banana peel to each and cover the banana peel with soil. Place one baggie at room temperature away from the sun and to the remaining three baggies add water and moisten the soil. Place one baggie in the refrigerator, one baggie in the sun, one baggie at room temperature but away from sun, and one baggie in a closet or cabinet. Re-examine contents of baggies in a week to ten days.
2. Get into three groups.
  - Group 1 makes a list of all recyclable products on the truck pattern provided.
  - Group 2 makes a list of reusable products on another truck pattern.
  - Group 3 makes a list of all reducable products on another truck pattern.
3. Students collect and sort different recyclable products (cans, paper, glass).
4. Students discuss how they can reuse products listed.
5. Purchase a plastic truck.
  - Write reduce, recycle, reuse products or facts on slips of paper.
  - Read the fact. If it is true place it inside the plastic dump truck. If the fact is untrue throw it away.
  - Display in a center for children to review.

### **ORIGINAL DEVELOPMENT RESOURCES:**

Bottle Biology Resources Network, (1990). University of Wisconsin-Madison. Found at:  
<http://www.sbwater.org/uploadedFiles/sbwater/education/BottleBiology.pdf>



# Notes

## OBJECTIVES:

The student will be able to:

1. Observe how plants recycle.

## BACKGROUND:

Some items we consider to be waste can be used to grow plants, rather than being sent to the landfill. These plants benefit the environment in other ways as well. They add oxygen to the atmosphere and produce new, useful vegetation. Students should learn to consider plants as recyclable and renewable resources that can also produce usable products such as food.

## ADVANCE PREPARATION:

Teacher will gather an assortment of seeds or pits or vegetable parts and containers for plants and potting soil. (Students could be asked to save these, too, and bring them to school.)

## PROCEDURE:

### *Setting the Stage*

Lead a class discussion on what might happen to some of our kitchen waste when it is discarded. The teacher might want to bring some different types of fruit as a snack so students can consume the fruit and see the waste leftovers.

### *Activities*

Plant seeds or plant parts as a whole group activity or in cooperative groups. Some suggestions are as follows

1. Carrot top in water: Cut about 1" - 1 1/2" off the top of the carrot. Fill shallow bowl 2/3 full of washed pebbles (could use salad containers from fast-food restaurants). Place carrot top on pebbles. Add water to the level of the pebbles and maintain this level at all times. Soon the tops will sprout.
2. Pineapple in water: To separate the top from the fruit, hold the fruit firmly in one hand and twist the leafy head with the other. The top should come right off. (This only works if the fruit is very ripe. You may have to cut off if fruit is green.) Remove the lower leaves until the stump is about 1 1/2" long. Place top in a glass of water and change water weekly. When roots are 3"-4" long, transplant to a pot.
3. Beans/Peas: Soak dried beans overnight in water. Plant seeds about 1/2" in moist potting soil using a salad container from a fast-food restaurant. Now place the lid on the container and set in a sunny window. When the seeds begin to grow, remove the plastic lid.
4. Oranges, Lemons, Grapefruit: Soak seeds overnight in water. Plant seeds about 1/2" in moist potting soil using a salad container from a fast-food restaurant. Now place the lid on the container and set in a sunny window. When the seeds begin to grow, remove the plastic lid.
5. Sweet Potato: Cut off three inches of the end of a sweet potato. Place toothpicks around the other end. Fill a quart jar with water, and place the potato in the jar using the toothpicks to support the potato around the jar opening.
6. Other seeds, such as avocado or mango seeds, can also be grown. Avocados can be grown in water like the sweet potato. Mango seeds need to be planted.

### *Follow-Up*

1. Divide students in cooperative groups according to the food items used in the project.
2. Have them predict what they think will happen to their item over the next ten days. (Some may take more

## Grades:

K-2

## Subject:

Science

## Time Needed:

45 minutes and a few minutes daily for observing and recording for ten days

## Materials:

seeds, pits, vegetable or fruit parts  
potting soil  
containers for plants  
water

than ten days.) They may write or draw their prediction.

3. Allow students to observe and record changes in their plant over the next ten days.
4. Let each group report its observations to the class to confirm or reject its predictions.

### **EXTENSIONS:**

1. If possible, schedule a tour of a local grocery store's produce department. The teacher may wish to purchase more unusual or exotic types of fruit to introduce students to different foods.
2. Have students diagram and label the parts of their plant.
3. Have students in groups come up with original tongue twisters describing natural recyclables.  
Ex. 1) Pollution Pete picked up a peck of paper particles.  
Ex. 2) Reliable Ron replanted a row of recycled radishes.  
The group that receives the best response from classmates get to take home all recycled plant projects

### **ORIGINAL DEVELOPMENT RESOURCES:**

Goodman, B. (1990). *A kid's guide to how to save the planet*. New York, NY: Byron Preiss Visual Publications, Inc.

## OBJECTIVES:

The student will be able to:

1. Identify common household items that are recyclable.
2. Explain the process of making recycled paper.

## BACKGROUND:

By recycling paper, we can greatly reduce the amount of solid waste that has to be dumped or incinerated. It has been estimated that paper forms about a quarter of the weight of garbage in household garbage cans. It also is a significant part of office and school waste. Over a third of the total weight of solid waste in the United States is made up of paper in one form or another. Recycling paper not only reduces the amount of paper disposed of in landfills, but it also helps save a valuable natural resource - trees.

## ADVANCE PREPARATION:

Gather all supplies for making paper.

## PROCEDURE:

### *Setting the Stage*

Discuss with class where paper comes from - trees. Explain why we should recycle paper. Show different examples of paper, colored paper, textured paper.

### *Activities*

To make paper from paper :

1. Tear (do not cut) newspaper into 2 cups of very small pieces. Add 1 cup of hot water and stir for three to five minutes. Use a blender for best results.
2. Add liquid starch and stir three more minutes. Slowly pour paper pulp on screen and move pulp around until screen is covered.
3. Lift screen and let drain for a few seconds. Then place it on a piece of cloth and on a section of newspaper. Place another piece of cloth on top, and then put a second section of newspaper over it.
4. Press the excess water out by rolling the jar over the newspaper. Take off the top newspaper, turn the cloth sandwich over, and take off the top piece of cloth and the screen.
5. Let recycled paper dry for two hours then gently pull off cloth. Let recycled paper dry overnight before writing on it.

### *Follow-Up*

1. Write a class letter on the recycled paper to an elected government official asking for support on environmental issues.
2. Write a letter to nursing home patients on recycled paper.
3. Have students write or dictate the sequence of steps involved in making recycled paper.
4. Check your final paper product to find out if it is symmetrical. Fold the paper to see if the ends meet neatly.

## Grades:

K-2

## Subjects:

Science, Language Arts

## Time Needed:

60 minutes

## Materials:

piece of window screen attached to an old picture frame  
pan larger than screen  
spoon  
3 Tablespoons liquid starch  
jar  
two pieces of cloth 8"X10"  
two sections of newspaper  
two cups of hot water  
blender

## **EXTENSIONS:**

1. Visit a local newspaper office to see how newspapers are printed.
2. If there is a paper plant in the area, tour the facility to see how paper is made.
3. Have students survey local businesses to see how many participate in paper recycling.
4. Start or help with paper recycling in the school.
5. Have a small clean garbage can. Children break into groups. Find recycling facts in the books. After writing important facts on small sheets of paper, wad up the paper and throw them in the trash can.  
Discuss: don't throw away that piece of paper - recycle it. Whenever you have a few minutes, before lunch etc, pull out a wadded sheet of paper and read the fact. Use them for games etc.

## **ORIGINAL DEVELOPMENT RESOURCE:**

Dees, L., & Force, B.A. (1987). *Alabama pals litter education activity guide*. The Center for Environmental Research and Science, Troy State University.

## OBJECTIVES:

The student will be able to:

1. Discuss how trash items can be used for other purposes.
2. Perform basic math operations using “trash” manipulatives.

## BACKGROUND:

Learning basic math operations is a vital skill for young children. Math concepts should be presented to young children using real manipulative materials. There is an abundance of trash items available to teachers and students. Use them to teach creativity. This activity will actively involve students in the learning process by engaging them in collecting the teaching materials as well as using them as part of the learning experience.

## VOCABULARY:

**recyclables** - useful materials from garbage or waste that are used again and reprocessed

## ADVANCE PREPARATION:

1. Have students and their parents collect and send plastic six-pack rings. Also needed are small trash items that can be used as counters: buttons, bottle tops, seeds, beans, packing “peanuts.”
2. Cut rings into sections of two or three for teaching addition. If teaching multiplication, leave the six-pack rings together.

## PROCEDURE:

### *Setting the Stage*

Tell students that they will be using the six-pack rings and other small trash items to do some math problems. Discuss what can happen to aquatic animals if six-pack rings are thrown in the water. Animals can swallow them or catch body parts in them. Always dispose of properly and cut the rings.

### *Activities*

These manipulatives can be used to teach three basic math concepts depending on the learning level of the students.

1. Addition with Two Addends - Facts to 18  
Cut rings into sections of two. Write an equation such as  $7 + 3$  on the board. Students will then fill each ring with the correct number of counters (7 and 3). Then tell students to count them together to get the answer ( $7 + 3 = 10$ ). Students may work in pairs. One student can make up and write the equations while the other uses the manipulatives to solve them.
2. Addition with Three Addends - Facts to 18  
Cut the rings into sections of three. Follow the above procedure using three addends instead of two. The teacher can direct the students to turn their rings horizontally or vertically depending on how the equations are written.
3. Multiplication Facts  
Leave the six-pack ring together to do multiplication facts through the sixes. Write a multiplication fact,

## Grades:

K-2

## Subjects:

Math, Science

## Time Needed:

45 minutes

## Materials:

10-20 plastic six-pack drink rings  
trash items to be used as counters:

old buttons

seeds

dried beans

packing “peanuts”

bottle tops

paper

pencil

such as  $3 \times 4$ , on the board. Tell students to place sets of three counters into four rings. Then have them count the total number of items:  $3 \times 4 = 12$ . Do this several times as a group. Students may then work in pairs. One student can make up and write the multiplication equations while the other uses the manipulatives to solve them.

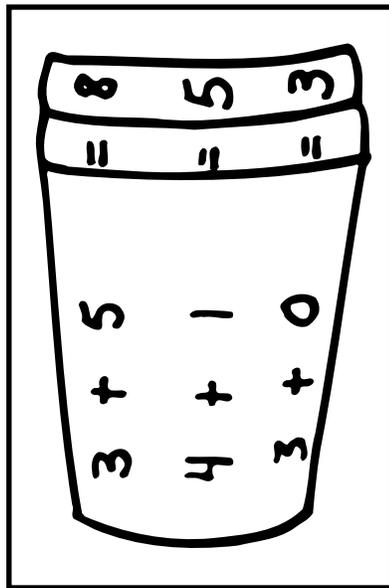
4. Use six-pack rings for sorting various items: shells, rocks, etc.

#### *Follow-Up*

1. Place rings and counters in a math center. Have students formulate their own addition or multiplication equations and record them using these manipulatives.
2. Have students make up and write word or story problems. Share them with the class. Students can then solve the problems using their “trash manipulatives.”

#### **EXTENSIONS:**

1. Use six-pack rings for other classroom activities such as art. Create circles and patterns to make designs or pictures. For example, draw six rings in a line to make a caterpillar. Make a flower from circles. Draw one in the middle and surround it with five or six other circles to form the petals. Use markers or paint to add features, color, or on background. Cut the rings before disposing.
2. Stack two styrofoam cups. Label the outside cup with a series of math facts. Label the rim of the inside cup with the corresponding answers. A student restacks the cups so that the facts and answers correspond.



#### **ORIGINAL DEVELOPMENT RESOURCES:**

Original idea by Lynn Libell, Tuscumbia City Schools, Tuscumbia, AL.

## OBJECTIVES:

The student will be able to:

1. Explain the importance of recycling materials into usable items.
2. Demonstrate different rhythms and beats and create his/her own music.

## BACKGROUND:

Each day we discard and dispose of many items that with a little creativity could be used to teach sounds and rhythm. It's easy to "recycle" household items into great teaching tools that allow children to engage in many fun music and art activities.

## VOCABULARY:

**rhythm** - a beat that accompanies music

## ADVANCE PREPARATION:

Gather many assorted materials that students can use to make their own instruments.

## PROCEDURE:

### *Setting the Stage*

Lead a class discussion on musical sounds and rhythm. Consult music books about native American drums and African instruments.

### *Activity*

Construct several instruments from materials considered to be trash.

1. **Yogurt Cup Shakers:** For each shaker, you will need a clean empty yogurt cup, hot glue gun, popcorn kernels, dried beans, gravel, sand, small shells, or other small items. Use a yardstick, ruler, wooden spoon, or a paint stirrer for a handle. If the handle isn't wide enough to seal the cup's opening, cut from strong cardboard, a cover to fit. Pour various amounts of different materials into the yogurt cup and shake it until you find a sound you like. Hot glue the cup to the handle. If you are using a cardboard cover, glue that to the cup first. Then glue the cardboard to the handle.
2. **Bottle-Cap Tambourines:** For each tambourine, you will need a strong Y-shaped branch, about a dozen metal bottle caps, and strong wire. If desired, remove the rubber liners from the caps by heating them for 5 minutes on an outdoor grill. Flatten the caps with a hammer. Then use a nail to punch a small hole in the center of each cap. Thread the caps onto the wire and string tautly between the arms of the Y.
3. **Box Harp:** For each box harp, you will need a small box with lid (decorate if you wish). Use a craft knife to cut an oval hole in the lid. For a bridge, fold a strip of cardboard into a triangular prism and cut four notches along the top. Glue the bridge in place below the hole. Slide four rubber bands of different widths over the box and into the bridge notches.
4. **Coffee Can Bongo:** Use a can opener to remove both metal ends from the can. Replace with the plastic lid or a balloon. Cover the outside of the can with colorful paper and decorate with paint, crayons, sequins, or other items.

## Grades:

K-2

## Subjects:

Music, Science, Art

## Time Needed:

60 minutes

## Materials:

yogurt container  
glue, hot glue gun  
dried beans, popcorn, sand, shells,  
aquarium gravel  
rulers, paint sticks  
bottle caps  
strong wire  
Y-shaped branch  
hammer, nail  
small box with lid  
craft knife  
rubber bands with different widths  
coffee can with plastic lid  
can opener

*Follow-Up*

1. Have a trash tune parade in the school halls or on the playground
2. Use the instruments to accompany a variety of types of music: jazz, blues, folk, popular, Native American and African rhythms.

**EXTENSIONS:**

1. Have students write a Trash Tunes Rap that features each instrument.
2. Correlating sound waves to water levels. Use identical drinking glasses each filled with increasing levels of water. Have students tap each glass with a metal spoon, then ask students to write or tell of the observations of sound and water levels.
3. Make decorative items from recycled materials for a nursing home.

**ORIGINAL DEVELOPMENT RESOURCES:**

Whitemore, K. (1996, March). Music makers. *Family fun magazine*. pp.70-76

## OBJECTIVES:

The student will be able to:

1. Turn disposable items into creative entertainment for themselves.
2. Identify disposable items and suggest ways to use them for fun and enjoyment.

## BACKGROUND:

Outer space holds many wonders for children of all ages. We can get there quickly by using our imaginations and recycling some disposable household items. Often the items we consider disposable may be valuable tools for teaching and learning, or self expression through creativity.

## ADVANCE PREPARATION:

Gather supplies. Cut space helmets from milk jugs. Hot glue two two-liter bottles together. Make constellation templates from poster board.

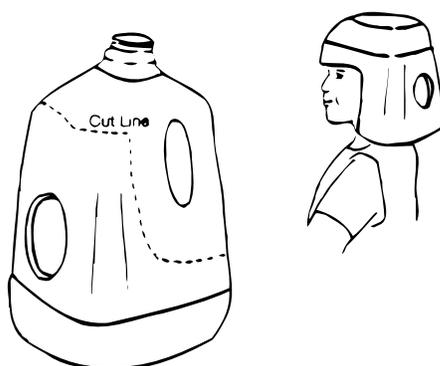
## PROCEDURE:

### *Setting the Stage*

This activity may be used with a space unit or perhaps as a follow-up to a reading story about stars, planets, astronauts, or space shuttles.

### *Activities*

1. Using a utility knife or sharp scissors, cut a space helmet from the milk jug in the shape shown in the illustration. Decorate the helmet with discarded items, bread ties, seeds, shapes cut from old notebook covers, Styrofoam packing, peanuts, film canisters, pipe cleaners.



2. Construct an oxygen back pack using two two-liter bottles, yarn, and plastic beverage rings. Begin by hot gluing the two-liter bottles together, side-by-side, to form the life support back pack. Cut the beverage rings down the center to make two sets of three rings. Connect these with yarn until you achieve the proper length to form shoulder straps for back pack.

## Grades:

K-2

## Subjects:

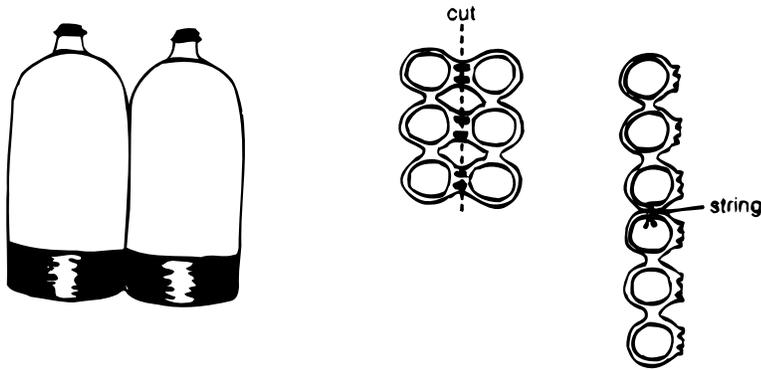
Science, Art

## Time Needed:

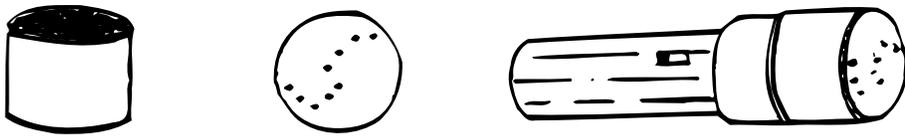
60 minutes

## Materials:

utility knife  
glue  
hot glue  
scissors  
one-gallon milk jug  
two two-liter bottles  
several beverage rings  
yarn  
vienna sausage can  
nail  
hammer  
poster board template of constellations  
standard flashlight  
miscellaneous decorative materials



- To construct a constellation can, you will need: a vienna sausage can, nail, hammer, and teacher-made template of constellations. Place clean can open end down and then place constellation template on the bottom of the can. Gently hammer nail through can at the points where stars are in the constellation. Most standard flashlights will fit the can opening. Turn off lights and view your constellation. Discuss the shapes of the constellations. Add the number of stars in the constellations. Name the constellation with the most stars. Find the constellations that have an even number of stars, and odd number of stars.



- Do in groups. You are going to travel in space. You don't have much room in your space shuttle, therefore you can only pack things you need in order to live. What will you take with you?

#### *Follow-Up*

- Discuss transportation today and a long time ago. Explain how travel today has connected us to the world geographically and economically.
- As a whole class or as a cooperative group, write an activity and act out a space adventure. You may wish to select planets in our solar system to visit, or others may choose a space fantasy.

#### **EXTENSIONS:**

- Create a space travelling machine from an appliance box to add to the excitement of space travel.
- Display the importance of recycling air for space travel. Use a stopwatch to time and chart the length of time students can hold their breath. Discuss the importance and methods for recycling air on a space ship. Teacher may need a little research of their own to adequately handle student questions.

#### **ORIGINAL DEVELOPMENT RESOURCES:**

Williams, R., Rockwell, R., & Sherwood, E. (1987). *Mudpipes to magnets: A preschool science curriculum*. Mt. Ranier, MD: Gryphon House.

## OBJECTIVES:

The student will be able to:

1. Define composting.
2. Create soil from composting
3. Construct compost in a container.
4. Observe changes that will happen to the compost pile during the school year.

## BACKGROUND:

Landfills in Alabama are filling up fast. Residents are encouraged to recycle newspapers, cans, glass, and plastics. Landscape recycling is an important way to save landfill space. Lawn clippings and tree trimmings comprise 30% of the material being dumped into our landfills. Through the process of composting we can help Mother Nature recycle in our own backyard. This economical way of recycling produces rich soil for our backyard gardens, which contain important nutrients and help the Earth in many ways. Bacteria in the compost piles break down organic matter. The organic matter consists of grass clippings, leaves, flowers, weeds, twigs, fruits, vegetables, etc.

## VOCABULARY:

**compost** - a mixture of plant and food waste used to fertilize the soil

**decomposition** - to decay or rot from a process of microbial action

**bacteria** - microscopic, one-celled organisms. Most act as decomposers.

**organic** - formed from living matter

## ADVANCE PREPARATION:

1. Obtain a scrap bucket or medium-sized garbage can.
2. Drill holes in the bottom for drainage.
3. If composting is done inside the classroom provide a container to catch drainage.
4. Collect scraps for composting

## PROCEDURE:

### *Setting the Stage*

1. Brainstorm definition of composting.
2. Ask students what they think can be composted and what can't.
3. Question students on benefits of composting to the environment.

### *Activity*

1. Fill a scrap bucket with 1/3 dirt.
2. Add a few vegetable and fruit scraps (no meat or dairy products). Chop scraps into small pieces for faster decomposition.
3. Add leaves, grass clippings, and flowers.
4. Add more dirt to the bucket.
5. Turn the mixture with a spoon every few days and keep it damp by spraying it with water. Make sure the top of the mixture is always covered with dirt each time the mixture is turned over.

## Grades:

K-2

## Subjects:

Science, Math

## Time Needed:

One Hour

Additional time will be needed for maintenance and observations.

## Materials:

seeds

bucket

scraps (grass clippings, leaves, vegetable and fruit).

6. Eventually the food mixture will disappear. This will be compost and now is ready to use for planting. It will look like soil.
7. Plant seeds.

### *Follow-Up*

*Discuss the following questions;*

1. Why is composting important? The more we compost the less garbage we will have. Fact: More than one-fourth of the discards headed for the landfill can be composted.
2. How can you tell when the compost is finished? When it looks like rich dark soil.
3. How does composting help the Earth? Composting puts important nutrients in the soil. It extends the life of a landfill. It's nice to know you are helping Mother Nature.

### **EXTENSIONS:**

1. Expand into larger composting areas at your school.
2. Refer to "Wiggling Willy" in Learning Through Legacy (K-2).
3. Try adding other materials such as shredded newspaper, coffee grounds, and egg shells. Experiment to see which decomposes first.
4. Locate the landfills nearest your school. Refer to "We're Down in the Dumps" in Learning Through Legacy (3-5) which contains a landfill map. Refer to "Backyard Composting" in Learning Through Legacy (3-5).
5. Measure height of the materials in the bucket. Measure weekly and compare as matter begins to decompose.
6. Check the prices of potting soil. Analyze the amount of money that can be saved yearly by composting.

### **ORIGINAL DEVELOPMENT RESOURCES:**

"Composting : Feed Your Landscape". Cooperative Extension Service. The University of Georgia.

# INTRODUCTION TO NATURAL RESOURCES

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## **What Are Natural Resources?**

A good working definition of Natural Resources requires defining the two words, natural and resources, separately and combining those definitions. “Natural” can be defined as something present or produced, in nature. “Resource” can be defined as that which is useful and for which there is an available supply. By combining these two definitions, “natural resources” can be defined as something present in, or produced by, nature with an available supply that can be drawn upon when needed. Natural resources also can be categorized as earth materials and as all life forms. Those natural resources include air, water, soils, natural vegetation, and all rocks and minerals.

## **Who Uses Natural Resources?**

People use natural resources. Every aspect of life requires that we use natural resources. When one gets up in the morning and eats breakfast, one is using natural resources. The electricity that turned on the lights, the water in the shower, and the food that is on the table came from natural resources. All day long we use natural resources. Sometimes they are used in other ways, such as enjoying one’s surroundings by visiting a state or national park or forest.

## **Alabama’s Natural Resources**

Alabama is fortunate in that it has an abundance of many natural resources. Farmers use the soil to produce many products, such as cotton, potatoes, tomatoes, and peanuts. On some areas of land, trees are grown to produce wood to build houses and to make paper for many purposes. In recent years, oil (a product that we use every day) has been found, and drilled, for in Mobile Bay. Across the state, people use water to produce electricity (hydroelectric dams) and to fish for food and sport. As one can see, Alabama has an abundance of natural resources, BUT we must manage them correctly so that they will last for generations to come.

## **Conserving Our Natural Resources for Future Generations**

It is important for Alabamians to pay close attention to the ways they manage natural resources. There are many public and private organizations that work to assure that our natural resources are adequately maintained, but, in the end, it is up to the individual citizen to do his or her part. Whether it is by picking up trash, recycling, planting trees, or volunteering with an environmental organization, everyone makes a difference, and everyone must help to insure that generations to come have the necessary natural resources.



## OBJECTIVES:

The student will be able to:

1. Describe the life and contributions of Johnny Appleseed.
2. Discuss the difference in factual or fictional information.
3. Discuss the benefits of trees to the environment.
4. Identify the locations of the states of Pennsylvania, Ohio, and Indiana.
5. Put in sequential order the growth stages of a tree.

## BACKGROUND:

Johnny Appleseed was born John Chapman in 1774 in Leominster, Massachusetts. When he was 23 years old, he traveled west to plant his famous apple seeds in Pennsylvania, Ohio, and northern Indiana. Apples were very important to the wilderness settlements of early America, as they were one of the few crops that could be grown and harvested easily and eaten in one form or another all year round. People have been telling Johnny Appleseed stories for almost 200 years, so it is sometimes hard to separate the real history of his life from the legends. Johnny Appleseed died in Fort Wayne, Indiana, in March 1845. Johnny Appleseed Day is September 26.

## VOCABULARY:

**seed** - a small structure from which a plant or tree grows

**fact** - something known to be true

**fiction** - something made up or imaginary

## ADVANCE PREPARATION:

Draw identical trees on four separate large pieces of drawing paper.

## PROCEDURE:

### *Setting the Stage*

Read *Johnny Appleseed* by Reeve Lindbergh or any book about Johnny Appleseed.

### *Activities*

1. After reading about *Johnny Appleseed*, discuss with the students the great contribution John Chapman made to our country by planting apple trees on the American frontier. Point out that planting a tree today is a way we can help the environment.
2. Using a map or globe, trace Johnny Appleseed's travels across the American frontier.
3. Discuss the difference between the factual and fictional part of Johnny Appleseed's life. Let the students explain why they think an event in Johnny Appleseed's life was fictional or factual.
4. Show pictures (included) of the different stages of tree growth (beginning with the seed, seedling). Have the students put the pictures in sequential order. Have them write or dictate sentences about each stage of the growth of a tree.
5. Have the students put on a play about being pioneers or explorers and finding one of Johnny Appleseed's apple trees.

## Grades:

K-2

## Subjects:

Science, Language Arts, Social Studies, Art, Music

## Time Needed:

two 30 minute periods

## Materials:

*Johnny Appleseed* by Reeve Lindbergh  
four large tree pictures  
green, yellow, red, orange, pink, and  
white paints  
cottonballs or fiber fill  
crayons  
pencils  
pictures of the growth stages of an  
apple tree  
three to four sweet apples  
knife  
sauce pan  
a half cup of water  
half tsp. cinnamon

6. Discuss the different ways we use apples (applesauce, baked, raw, in pies).
7. Graph or tally students' favorite ways to eat apples.

### *Follow-Up*

Prepare applesauce.

Quarter, core, and peel three to four sweet apples. Cut the quarter pieces in half and put them in a sauce pan. Add 1/2 cup water, sprinkle on 1/2 teaspoon cinnamon, and simmer covered until the apples are tender (about 20 minutes). Let apples cool. Have the students mash the cooked apples with a potato masher or whirl them in a blender. Cool and eat. Makes six servings.

### **EXTENSIONS:**

1. Divide the students into four groups - Fall, Winter, Spring, Summer. Give each group a very large drawing of a tree. The Fall group will put leaves on their trees by making hand prints with red, yellow, and orange paint. After the paint dries, let the students draw ripened red or yellow apples on the fall apple tree. The Winter group will use cottonballs or fiber fill to put snow on the winter tree's branches. The Spring group will use pink and white paint to make apple blossoms on their spring tree. The Summer group will use green paint to make green hand prints to resemble green leaves on a summer apple tree. After the green paint dries, let the students draw unripened small green apples on a summer apple tree.
2. Song

**Do You Know the Apple Man?** (Tune: Do You Know the Muffin Man?)

Oh, do you know the Apple Man  
The Apple Man,  
The Apple Man,  
Oh, do you know the Apple Man  
Johnny Appleseed!

3. Finger play

High up in the apple tree  
Two little apples smiled at me.  
I shook that tree  
As hard as I could;  
Down came the apples  
They were good!

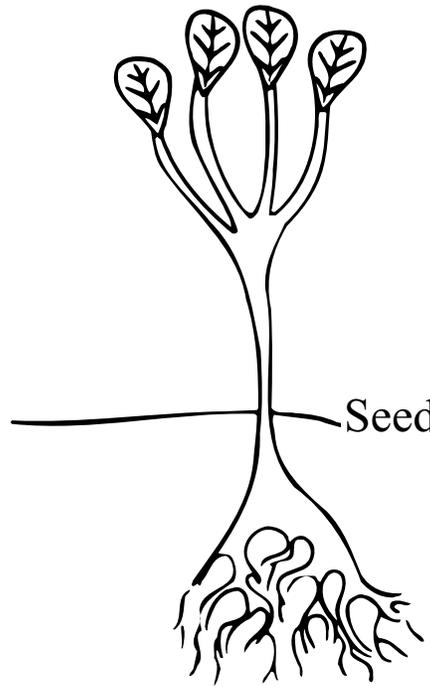
4. You may want to bring in some modern-day friends of trees. Contact the National Arbor Foundation and American Forestry Association in Washington, D.C. (See Resources.)

### **ORIGINAL DEVELOPMENT RESOURCES:**

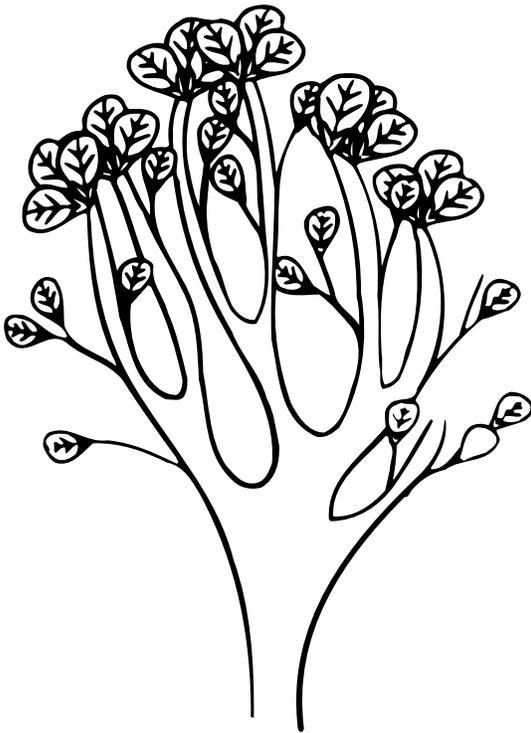
Lindbergh, R. (1990). *Johnny appleseed*. New York, NY: Little, Brown and Company.



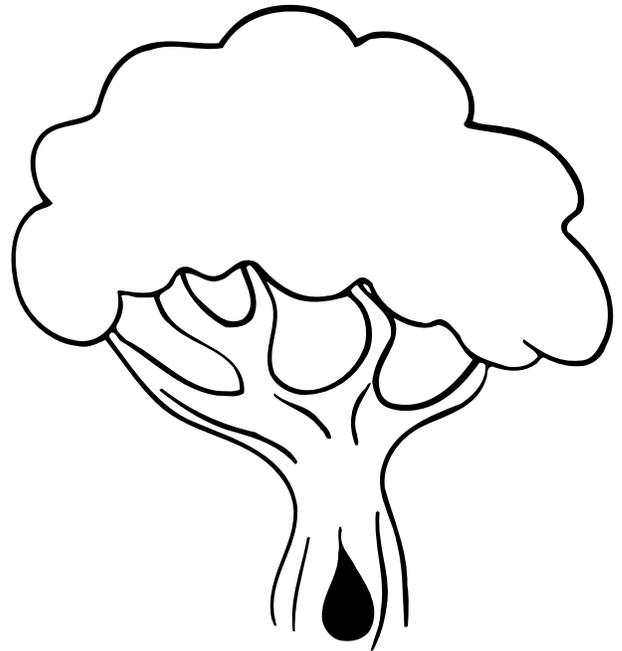
Seed



Seedling



Young Tree



Mature Tree

# Notes

## OBJECTIVE:

The student will be able to:

1. Describe the various characteristics of soil, including color and texture.

## BACKGROUND:

Soil covers the surface of the Earth. Soil is made from eroded rock and mineral particles that have been mixed with plant and animal matter. Soil may have different textures and colors due to factors such as the amount and kinds of minerals and decayed matter in the soil.

## VOCABULARY:

**soil** - part of our environment and Earth surface that is made up of mineral materials from rocks, partially decayed materials, and living organisms.

## ADVANCE PREPARATION:

Gather materials for the activity.

## PROCEDURE:

### *Setting the Stage*

Introduce the lesson by chanting the poem "Dirt" by Mary Ann Jenkins.

### **Dirt**

I like dirt  
Itty, bitty, gritty dirt.  
I like dirt  
Fuddy, duddy, muddy dirt.  
I like dirt  
In my socks or on my shirt.  
I like dirt.

### *Activities*

1. Ask the students to describe the dirt they might find in the school yard. Lead the students on a walk in the school yard. Collect dirt from different areas of the yard in clear plastic cups. Gather dirt from under vegetation, along the road or parking lot, in the playground. Dig a hole with the shovel to gather dirt from underground.
2. Lead the students in comparing the colors and textures of the dirt. Pour the dirt of different colors in layers in the clear plastic jar. Display the jar of dirt in the classroom.
3. Allow the students to bring samples of dirt from their own yards. Encourage them to try to find different colors and textures of dirt. On the following day, compare these samples. Ask the students if dirt from a river bank would be different in color and texture from their samples. Provide a sample of dirt from the edge of a river for the students to examine and compare.
4. Graph dirt samples by color and texture.

## **Grades:**

K-2

## **Subject:**

Science

## **Time Needed:**

First day: 40 minutes

Second day: 20 minutes

## **Materials:**

towel

clear plastic cups

clear plastic jar

sample of river bank soil

5. Discuss with students the type of soil that is best for growing plants (dark soil with a lot of decayed material). Ask students why this is the best kind of soil for growing plants (more nutrients for the plants). Also discuss what kind of soil students think would be best to build houses on. Ask them to give their reasons.

#### *Follow-Up*

Have students divide into cooperative groups and write a list of describing words for each sample collected. Make sure students identify where each soil sample came from.

#### **EXTENSIONS:**

1. Draw a design on cardboard. Spread glue. Then sprinkle dirt of different colors to create a “dirt picture.”
2. Grind dirt into a powder-like form. Alternate layers of dirt types in a small glass or plastic bottle to make dirt patterns similar to colored sand art.

#### **ORIGINAL DEVELOPMENT RESOURCES:**

U.S. Department of Agriculture Soil Conservation Service. (1992). *Teaching soil and water conservation*. More info found at: <http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/newsroom/features/>

# Surface Erosion: A Grass Roots Solution

## OBJECTIVE:

The student will be able to:  
Determine how the presence of vegetation affects surface soil erosion.

## BACKGROUND:

Surface erosion is the loss of important nutrients that support life. Water causes erosion that reduces the natural usefulness and productivity of the soil. Today's accelerated erosion is due to a conflict between humans and their environment. In our rapidly changing society, there is a large demand for new home sites, new recreation areas, and new shopping areas. Construction of this nature contributes to erosion. Often these new structures are located on what was prime farm land. Thus many farms are now located on less desirable land, some of which is more prone to erosion from various sources. The erosion rates depend primarily on four interacting factors:

- Type and amount of rainfall
- Length and steepness of the slope
- The erodability of soil
- The management of the land

Land areas covered by vegetation are not easily eroded by rain water or runoff because the plant roots help hold the soil in place. The effectiveness of ground cover depends on many factors such as:

- The percentage of ground cover
- The density and height of vegetation
- The capacity of plants to intercept water
- The amount of mulch on the soil surface
- The surface slope

Water flows slowly over a gentle slope and rapidly over a steep one. The energy of the flowing water increases with speed. The faster the water moves, the more energy it has to dislodge and transport soil particles. Because the slope of the land cannot easily be changed, controlling erosion involves taking measures to slow the movement of water including avoiding use of steep slopes for farming. Ways of limiting surface erosion due to slope and elevation of the land include terracing and planting crops on the contour. These methods help to ensure that water will soak into the soil and not run down the slope carrying nutrients and soil. The erosion process is responsible for polluting rivers and lakes and filling up lakes and reservoirs with soil particles.

## VOCABULARY:

**ground cover** - plants that cover the surface of the Earth

**mulch** - protective ground cover, including manure, wood chips, straw, seaweed, leaves, and other natural products, or synthetic materials, such as heavy paper or plastic, that protect the soil, save water, and prevent weed growth

**slope** - angled rise or descent of the Earth's surface

**soil** - part of our environment and Earth's surface that is made up of mineral materials from rocks, partially decayed materials, and living organisms

## Grades:

K-2

## Subject:

Science

## Time Needed:

60 minutes (Note: Some advance preparation is needed two weeks before the activity.)

## Materials:

soil  
grass seeds  
two notched wooden rectangular containers  
two watering cans with water

**surface erosion** - wearing away of Earth's surface by wind or water

**vegetation** - all the plants or plant life of a place

### **ADVANCE PREPARATION:**

Gather soil from the school grounds. Prepare one vegetation sample tray by planting grass seeds two weeks before date of experiment. If you do not have wooden trays, line a sturdy cardboard box with plastic and notch at the end.

### **PROCEDURE:**

#### *Activities*

1. Allow students the opportunity to investigate several soil samples. Have a magnifying glass available. Be sure they notice any grass roots clinging to the soil.
2. Prepare a second soil box by placing bare soil in it. Place receptacle jars in position (below the notched areas on each container - see illustration).
3. Pour equal amounts of water on each box until soil runoff is detected in at least one box. Predict what will happen to the soil and the water.
4. Examine both boxes and receptacle jars and compare levels of erosion.
5. Measure the water in the receptacles and compare with original amount.

#### *Follow-Up*

Have students diagram the two boxes of soil and illustrate how they were affected by surface erosion. Discuss and list reasons the surface erosion differed for each sample.

### **EXTENSIONS:**

1. Teach students the erosion song "There is a Rut" (included). Students should learn this song and sing it throughout the year. It may also be used as a handwriting activity.
2. Refer to "Many Kinds of Soils in Alabama" in Learning Through Legacy (K-2).

#### **"There is a Rut"** (Tune: Bingo)

There is a rut in the  
sandy soil,  
and water is the cause  
of it.

W-A-T-E-R (repeat three times)  
What are we to do?

There is a rut in the  
farmer's field,  
And water is the cause  
of it.

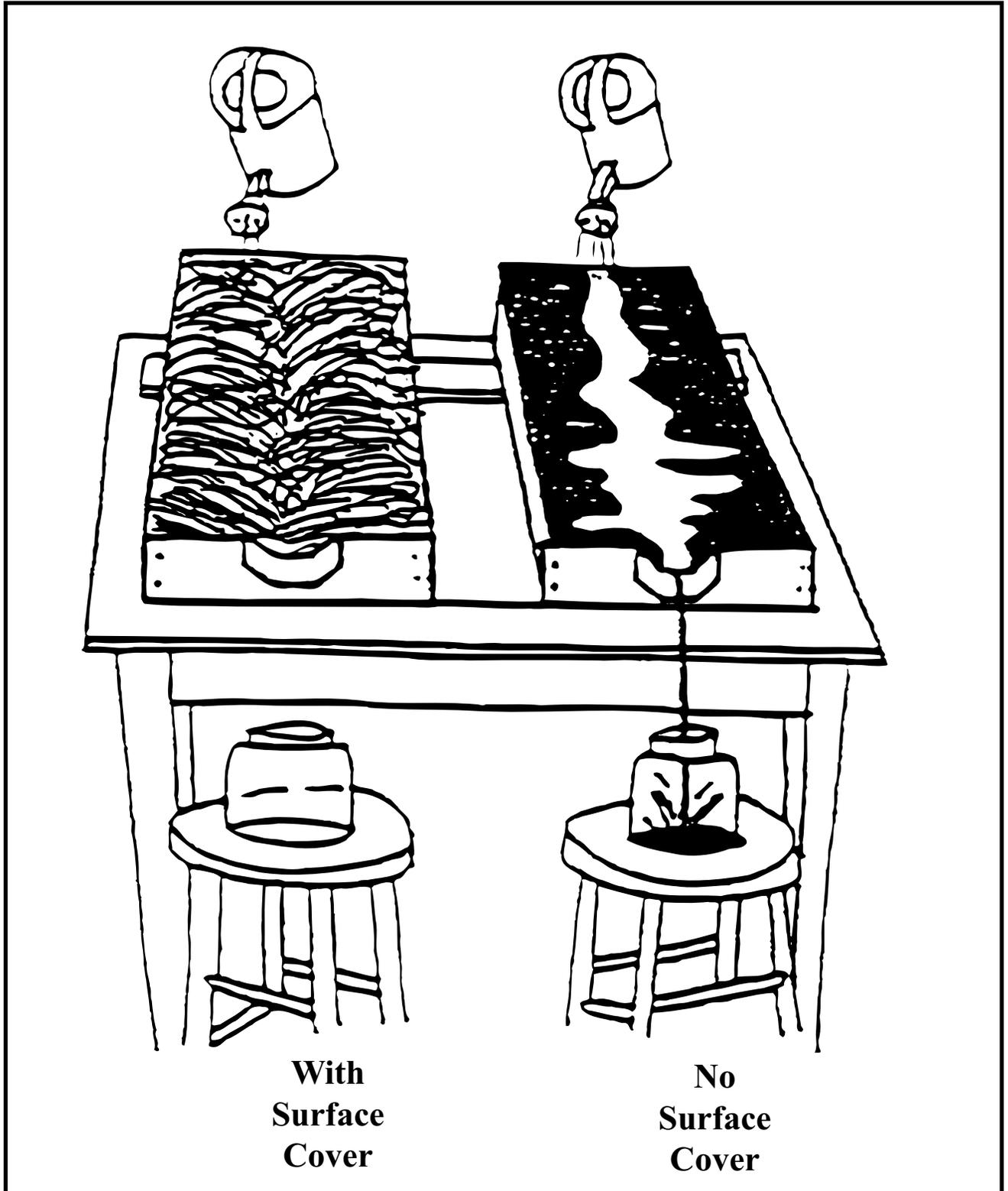
W-A-T-E-R (repeat three times)  
What are we to do?

Plant some flower, trees,  
and shrubs  
To keep the soil in place.  
S-O-I-L (repeat three times)  
Let's keep that soil in place.

### **ORIGINAL DEVELOPMENT RESOURCES:**

U.S. Department of Agriculture Soil Conservation Service. (1992). *Teaching soil and water conservation*. More info found at: <http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/newsroom/features/>

# Surface Erosion



**With  
Surface  
Cover**

**No  
Surface  
Cover**

# Notes

## OBJECTIVES:

The student will be able to:

1. List the importance of trees.
2. Identify and discuss the natural life cycle of a tree.
3. Make a list of tree products.
4. Make a list of animals that depend on trees.

## BACKGROUND:

Trees filter the air that we breathe, provide habitats, and furnish fuel and fiber. Trees provide numerous environmental benefits. The natural function and the life cycle of a tree are beautifully illustrated in *The Gift of the Tree* by Alvin Tresselt. Alabama has a vast resource of trees, both evergreens and deciduous trees of many types.

## VOCABULARY:

**deciduous tree** - a tree that sheds leaves during a particular season

**decomposition** - to decay or rot from a process of microbial action

**evergreen** - trees with green leaves all the year

## ADVANCE PREPARATION:

1. Prepare large cut-out leaves.
2. Secure magazines from which to cut out pictures.
3. Prepare a large tree form to attach to wall or bulletin board.

## PROCEDURE:

*Setting the Stage*

Read *The Gift of the Tree* by Alvin Tresselt.

*Activities*

1. Create a story on the board as students recall details from the story read to them.
2. Prepare a tree form and tape it to the wall or display it on a large bulletin board. Give students large cut-out leaves on which to glue pictures from magazines that represent products from trees, or show animals that make their homes in a tree or get shelter from trees.
3. Make a paper chain sequencing the life cycle of the tree, beginning with a seed and extending through decomposition and rebirth of a tree through its seed.

*Follow-Up*

1. Develop an ongoing classroom list of tree products.
2. Develop an ongoing classroom list of animals that need trees to live.

## EXTENSIONS:

1. Have the class collect and identify leaves from trees in Alabama. This can be an ongoing class project.

## Grades:

K-2

## Subjects:

Science, Language Arts

## Time Needed:

One period for the first part, ongoing

## Materials:

*The Gift of the Tree* by Alvin Tresselt  
(optional)

brown bulletin board paper

construction paper

magazines that provide pictures of food or products that are made from trees or animals that make their homes in trees or get their shelter from trees

2. Divide the students into groups and let each group choose one activity about trees from the attached sheet entitled “Tree Activity Leaves.”
3. Refer to “Speakers for the Earth” in Learning Through Legacy (K-2).
4. Refer to “Who Needs a Tree” in Learning Through Legacy (K-2).
5. Ask Alabama Forestry Commission for leaf and tree ID booklets. (See Resources.)

**ORIGINAL DEVELOPMENT RESOURCES:**

Telfer, C. (1995, Issue III). *Trees*. Good Apple Newsletter. pp. 48-51.

Tresselt, A. (1967). *The gift of the tree*. New York, NY: Lee & Shephard Books.

# Tree Activity Leaves

Locate one tree you can easily see from your classroom. Observe the tree throughout the seasons. Illustrate it during summer, fall, winter, and spring.

Go on a tree walk. Record the number of kinds of trees you find. Graph them.

Write a story entitled, "If I were a tree."

List ways trees help us.

List ways we can be a friend to trees.

Collect leaves from different trees. Discuss or list how leaves are alike and different.

# Notes

# What Is A Beach?

## OBJECTIVE:

The student will be able to:

Explain and identify the shoreline and a tertiary dune.

## BACKGROUND:

Waves and currents are the chief agents in the formation of beaches. Beaches are by no means stable. Most of them are constantly growing either wider or narrower. They also move towards or away from the land or parallel to the shore. In some instances, changes in beaches can be traced directly to the actions of people. Land building processes compete with land eroding processes at the water's edge. Dunes form slopes on the beach that are important to the slowing of incoming water. Dunes protect the land behind them from storms.

## VOCABULARY:

**beach** - an expanse of sand or pebbles along a seashore

**dune** - mound of sand usually covered with plants, formed by winds carrying sand into vegetated areas of the beach; forms slopes on the beach that are important to the slowing of incoming water

**shoreline** - the place where water and land meet

**tertiary dune** - the largest dune located the greatest distance from the shoreline (The tertiary dune forms the border for the beach area.)

## ADVANCE PREPARATION:

Gather materials.

## PROCEDURE:

### *Setting the Stage*

Using a globe or map, point out Alabama's beach area. Ask the students how many of them have vacationed on Alabama beaches.

### *Activity*

Explain vocabulary words by building a model of a beach. On a small piece of heavy cardboard, sketch the shoreline and beach areas. Use dough or clay and build up the beach from the shoreline to tertiary dune. Lightly sprinkle dough with sand and gently press the sand into the dough. Cut blue paper or plastic wrap to fit the shoreline to represent water. Use small plants to represent "dune vegetation." (These could be made by using toothpicks, paper, and cotton.)

### *Follow-Up*

1. Divide the students into cooperative groups and give them supplies to assemble the various areas of a beach, water, shoreline, and dunes. Older students may label their models.
2. As a class or in groups, have students make a list of descriptive words for each part of the beach: water, shoreline, and dunes.

## Grades:

K-2

## Subject:

Science

## Time Needed:

two 60-minute periods

## Materials:

modeling dough or clay  
blue construction paper or blue plastic wrap  
small plant pieces  
white sand  
heavy cardboard  
glue or tape  
globe

3. Have students explain why dunes are important. Ask students what might help hold the dunes in place. (vegetation - like sea oats)
4. Predict what might happen if a storm hits a beach with and without dunes.
5. Discuss how human actions of building on the beach affect dunes.
6. What three forces can move or destroy a sand dune (wind, water, developments)?

### **EXTENSIONS:**

1. Have students bring pictures of vacations they have taken at the beach. Share these with the class. Also have them bring shells and other things they found at the beach.
2. Have students write or dictate stories about a beach vacation.
3. Have students research the effects of hurricanes on Alabama beaches.

### **ORIGINAL DEVELOPMENT RESOURCES:**

Shepard, F.P. (1979). Seashores. *Popular science*, (Volume 2). Danbury, CT: Grolier, Inc.

# When I Was Young In The Mountains

NATURAL RESOURCES

## OBJECTIVES:

The student will be able to:

1. Compare and contrast modern life with rural life of long ago.
2. Explain how modern life is affecting our water, soil, and air.
3. Identify a mountain as a land formation.

## BACKGROUND:

The great forests that grow on many mountainsides give us lumber. Rich mountain grasslands are used for grazing. The rivers and streams that rush down steep mountain slopes provide water power for electricity. Large dams and power plants have been built on several mountain rivers. Rich deposits of coal, iron, copper, tin, uranium, salt, gold, silver and precious rocks and minerals often lie beneath the surface of a mountain. Almost as soon as a mountain begins to rise, erosion starts to wear it down. Rain and melting snow form streams that lead into rivers. The flowing water slowly cuts channels in the rock, washing away stones and other material. Sometimes the rivers cut great canyons between mountain peaks.

## ADVANCE PREPARATION:

Become familiar with the book *When I was Young in the Mountains* by Cynthia Rylant.

## PROCEDURE:

### *Setting the Stage*

Read *When I was Young in the Mountains* by Cynthia Rylant.

### *Activity*

Discuss how the children's lives in the book are different from children's lives today. Discuss what ways of life described in the book are better or more difficult than our ways of life now. Have the students think about whether the water and air are cleaner now or were cleaner when the author was a child. Have them think about whether the soil is richer and more productive now or then. Have them write and illustrate what they would like to do if they lived in the mountains.

### *Follow-Up*

1. Prepare a tasty snack of mountain food: cornbread, pinto beans, fried okra, pickles, etc.
2. Have students make a "then and now" chart of similarities and differences of modern life and rural life of previous years. Areas or topics that might be included are: How people get food; How people make a living; How land is used; What people do for fun; What kinds of houses were lived in then; What kinds of houses are lived in now. Relate proper clothing to a mountainous climate. How has modern life changed the mountain environment? (skiing, tourists)
3. Discuss ways that life during the time when the author was a child might have been difficult (outhouse, lack of running water, no electricity).
4. Differentiate between economic needs and wants.
5. Compare community needs.
6. Identify a major event in US history during the time period in the book.

## Grades:

K-2

## Subjects:

Science, Literature, Social Studies

## Time Needed:

60 minutes

## Materials:

*When I was Young in the Mountains* by  
Cynthia Rylant

**EXTENSIONS:**

1. Math - Graph how many of the students prefer modern life to life in the mountains.
2. Graph the places students prefer to live: the city, the beach, the mountains.
3. Make a model of mountains and extend to explain the watershed concept between the mountains. Show the formation of the rivers, valleys, build a dam along the river.
4. Combine with a geology lesson on rocks/minerals.
5. Refer to “Many Kinds of Soils in Alabama” in Learning Through Legacy (K-2).

**ORIGINAL DEVELOPMENT RESOURCES:**

Rylant, C. (1982). *When I was young in the mountains*. New York, NY: E.P. Dutton, Inc.

## OBJECTIVES:

The student will be able to:

1. Discuss the process of fossilization
2. Have an understanding of how fossilization creates fossil fuels.
3. Become aware of how quickly our supply of fossil fuels is diminishing.

## BACKGROUND:

A fossil is the preserved remains of any prehistoric organism. Fossilization occurs when plant and animal remains are compressed by mud, sand, and sediment over millions of years. Fossils are very common in Alabama. During the Mesozoic Era (the age of dinosaurs) the area that is now Alabama was mostly underwater. As a result sea fossils such as oysters and snails can be found in abundance.

Some of these fossils' remains became fossil fuels such as petroleum, coal, and natural gas. Fossil fuels are available only in very limited quantities. However, our society has grown extremely dependent upon them. The amount of fossil fuels burned by humans has nearly doubled every 20 years since 1900, quickly diminishing our reserves and forcing scientists to seek new sources of energy.

## VOCABULARY:

**fossil** - hardened or petrified plant or animal; a remnant impression, or trace of an animal or plant of past geological ages that has been preserved in the Earth's crust

**fossil fuel** - fuel found underground that is usually formed from dead plants and animals; fossil fuels include coal, crude oil, and natural gas

**prehistoric** - pertaining to the time before recorded history

## ADVANCE PREPARATION:

Collect and assemble materials.

## PROCEDURE:

### *Setting the Stage*

Explain to the students that a fossil is created when plants or animals of past geological ages are preserved in the Earth's crust. Tell the students that even though this process usually takes thousands of years, we can do an experiment to find out how it happens.

### *Activities*

1. Spread the damp clay or play dough in the bottom of the box or pan.
2. Press an item (some good items to use are shells, nuts, pieces of bark, feathers, or bones) into the clay or play dough with your hands. Be sure it is pressed all the way in.
3. Describe the item: size, shape, color, texture.

## Grades:

K-2

## Subject:

Science

## Time Needed:

60 minutes

## Materials:

small sturdy box or an aluminum foil  
tart pan  
clay or play dough  
plaster of Paris  
Items to fossilize such as:  
seed pods  
shells  
nuts  
pieces of bark  
feathers  
bones  
real fossils  
picture of dinosaurs

4. Mix the plaster of Paris with water to form a paste. (Do not mix until you are ready to use.)
5. Pour the plaster of Paris into the mold to cover the item completely.
6. Leave the plaster to dry overnight. Predict how it will look before you peel. Then peel away the box or pan and clay to reveal your own fossil creation.
7. Look for likenesses and differences in fossil and real object.
8. Match fossil molds to real objects.
9. Rotate the molds 90 degrees to 180 degrees and have students match to the real object.

*Follow-Up*

1. Have students collect items to “fossilize” in clay at an art center. Students can press or roll items into clay to experience the fossil effect. Predict how the fossil will look.
2. Develop a set of statements on sentence strips outlining the steps of fossil formation. Have students put these in order. Then use them as a reading or handwriting activity.
3. Display real fossils for students to look at and discuss.
4. Ask students which fossil fuels their families use and how we can conserve them.

**ORIGINAL DEVELOPMENT RESOURCES:**

Batchelor, D. (1984). *The fossil game*. University, AL: The Learning Line.

Forte, I. (1985). *Nature crafts*. Nashville, TN: Incentive Publications, Inc.

## OBJECTIVES:

The student will be able to:

1. Describe and illustrate the water cycle.
2. Define terms related to water.

## BACKGROUND:

Water is constantly changing states. Evaporation, the process of converting liquid to vapor, is a never ending process. Water from oceans, rivers and streams is constantly evaporating, forming clouds, and returning to Earth in different forms. Water is recycled from the Earth into the air and back to Earth.

## VOCABULARY:

**clouds** - mass of vapor in the sky

**condensation** - process of turning vapor to liquid

**evaporation** - process of turning liquid to vapor

**fog** - water vapor obscuring vision

**freeze** - to harden into a solid (as ice) by loss of heat

**precipitation** - condensed moisture that falls back to Earth

**steam** - gaseous or vaporized water

**vapor** - gaseous substance as steam or mist

## Grades:

K-2

## Subjects:

Science, Language Arts

## Time Needed:

Two days, 30 to 45 minutes

## Materials:

*Water's Way* by Lisa Westberg Peters

paint brushes (optional)

pail or bucket

hot plate

zip lock bag

ice

pot

## ADVANCE PREPARATION:

1. Locate the book *Water's Way* by Lisa Westberg Peters.
2. Collect other materials for the experiment.
3. Copy and give the illustration of the water cycle to each student to color. Discuss with students.

## PROCEDURE:

### *Setting the Stage*

Read the story *Water's Way* by Lisa Westberg Peters. Ask questions as you are reading: Who knows how the puddle formed on Tony's window sill? What do you think happened to the puddle of water on Tony's window sill? Why was Tony's bath water steamy? Why did the fog on Tony's window freeze? What do you think Tony saw out of his window when he got up? Introduce and discuss evaporation, precipitation, condensation, clouds, and vapor.

### *Activities*

1. Day One: Choose a warm day. Fill a pail or bucket with water. Give students paint brushes and have them paint with water on the sidewalk. Watch as the picture disappears. Discuss where the painting went. Redefine evaporation and explain that heat from the sun caused the water to change from liquid to vapor.
2. Day Two: Review activities and concepts from prior day. Put water in pot and place on hot plate. As water begins to boil, steam will rise. Redefine vapor as a different form of water. After observing and discussing water vapor, fill a zip lock bag with ice cubes. Hold ice at approximately a 45-degree angle above water. Create rain by allowing the droplets to form on the bag and gently shake the bag.
3. Discuss how the sun causes evaporation and cloud formation. Water vapor rises where the air is cooler and changes back to liquid form. Water falls from the sky in the form of rain, snow, sleet, or hail.

### *Follow-Up*

1. Give each student a piece of drawing paper, crayons, and a pencil. Have them illustrate what they have learned about the water cycle. For non-writing students, let students dictate to you as you write the story on the illustrations. Laminate the students' illustrations and stories and assemble into a book to share with the class. After reading it to the class, put the *Water Cycle* book in the classroom library.
2. Long-range lesson/activity studying precipitation and evaporation for one month.
  - Place rain gauge outside classroom at the beginning of any month, but try choosing a springtime rainy month
  - Check the rain gauge 2 - 3 times per week and graph the measurement over the entire month.
  - Teachers can read from an Almanac about the same month last year, and the amount of precipitation.
  - Have students make a second graph comparing last year's rainfall with this year.
  - For fun, students can guesstimate whether this year's rainfall will be higher or lower than last year's.
  - Have students make a third graph charting the amount of evaporation compared to the amount of precipitation.
  - Discuss the importance of the water cycle to our farmers - make sure your classroom has a copy of the *Farmer's Almanac*.
  - Discuss the importance the ozone plays in planning for artificial supply of water to farm crops.
3. Duplicate the two circle graphics and have students color each one. Cut out the squares and put the circles together using a brad. Ask students to explain the water cycle as they spin the graphic of arrows and water drops.

### **EXTENSIONS:**

1. Rain comes in many forms. Discuss the difference between a downpour, drizzle, sprinkle, rain and mists. Teacher, clearly define the difference between these terms, consult dictionary.
2. Place a small plant on science table. Cover with a clear glass jar. Observe condensation.

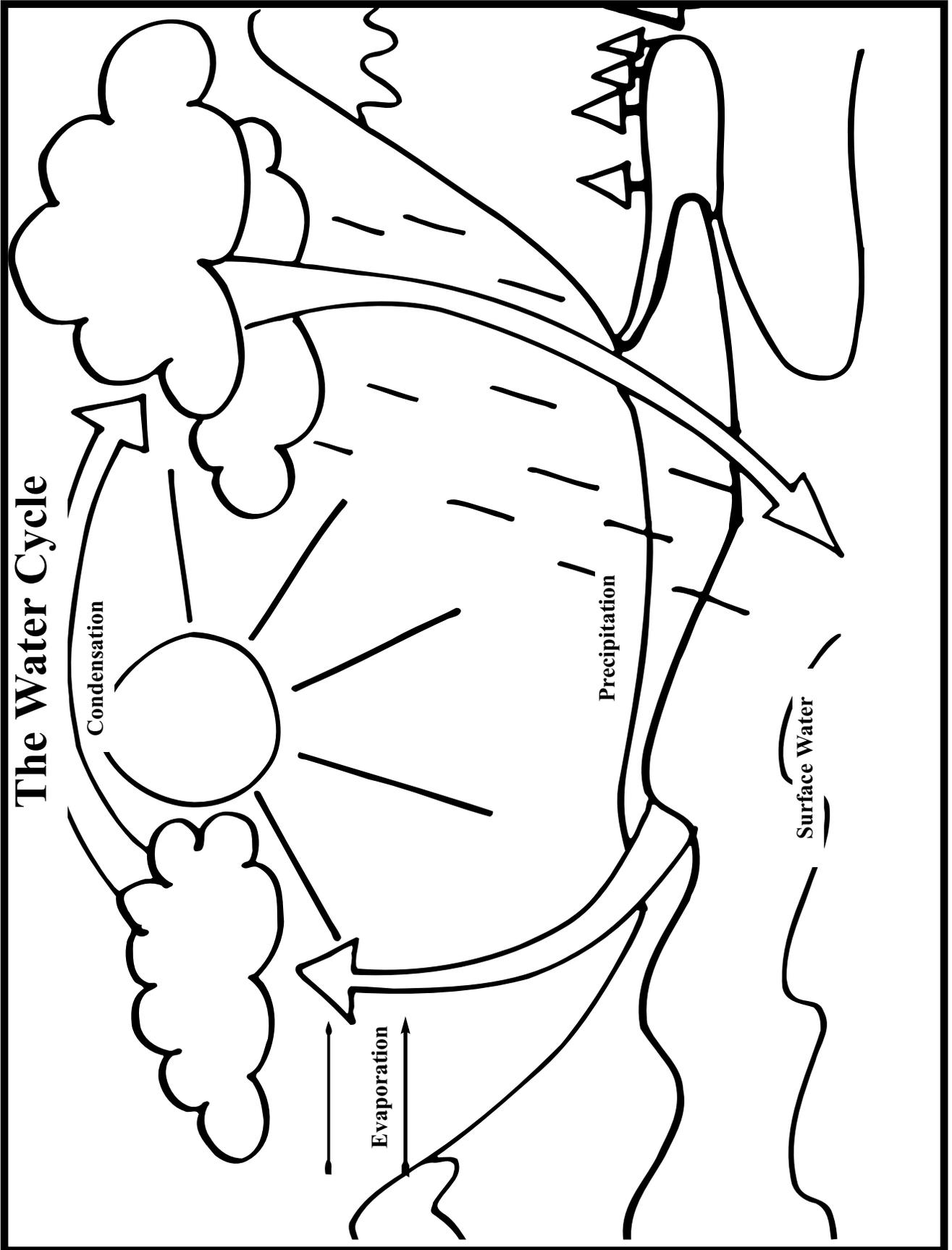
### **ORIGINAL DEVELOPMENT RESOURCES:**

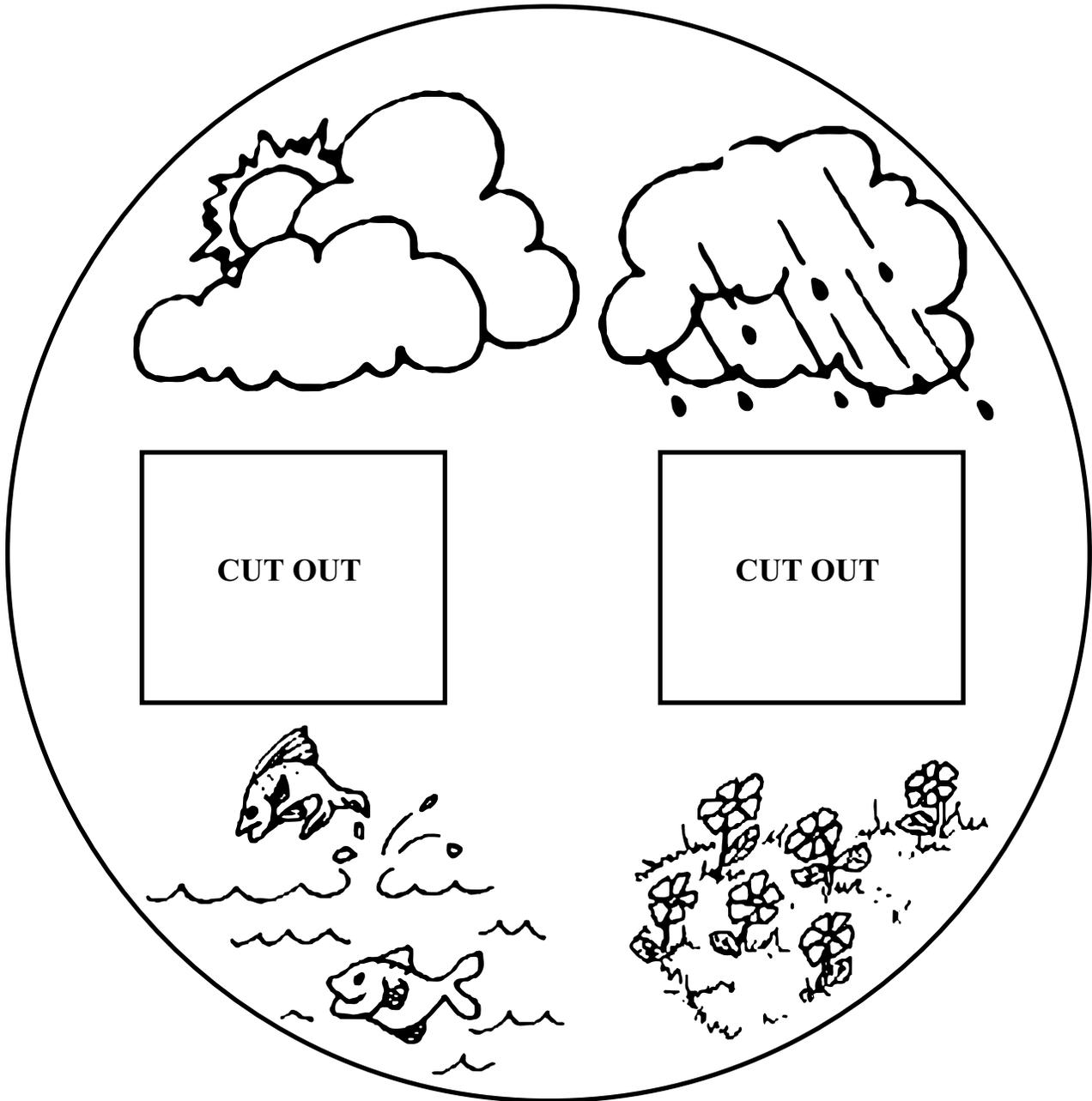
Pascoe, G. (1987). *Two feet*. South Australia: Era Publications.

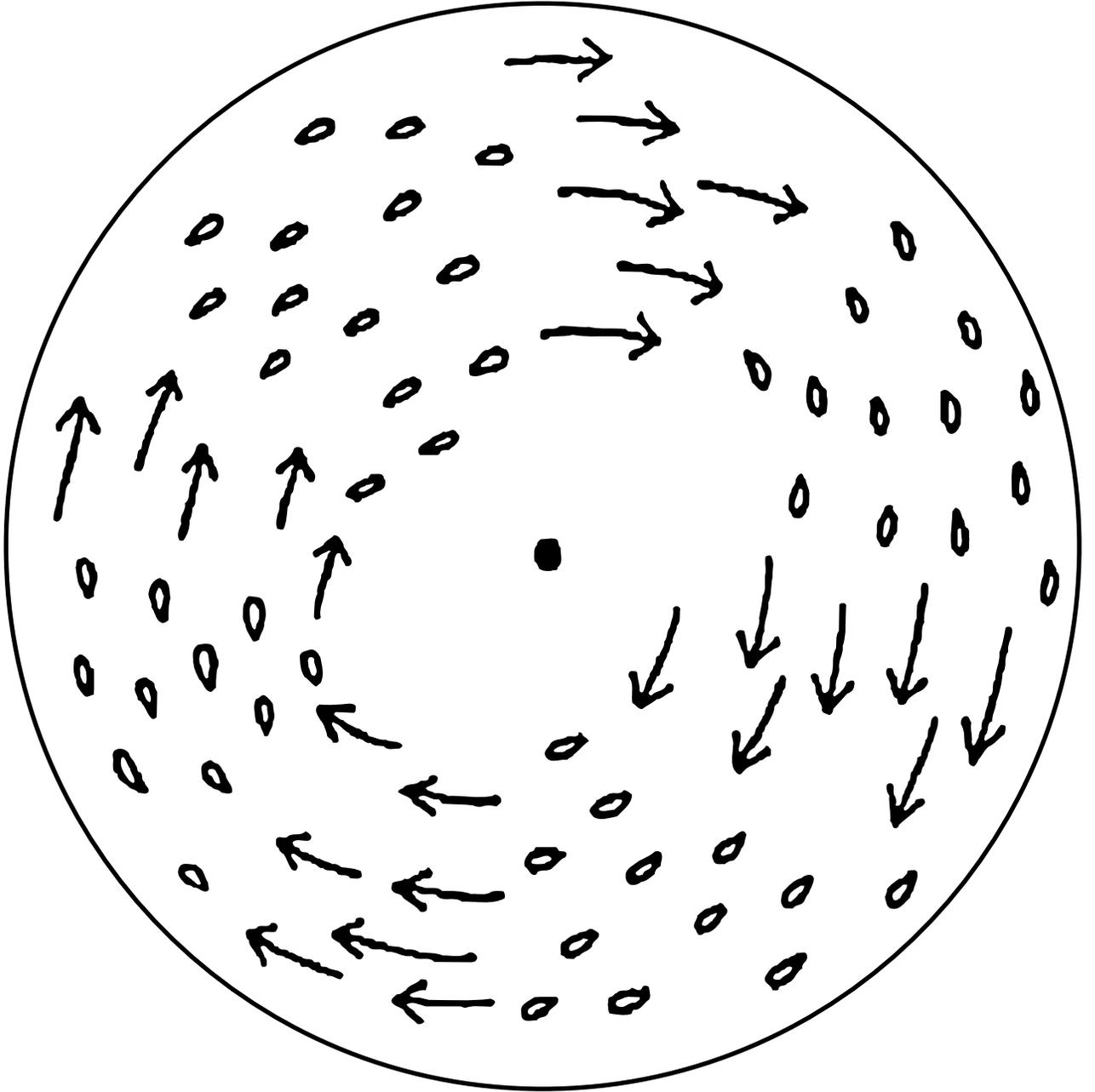
Peters, L.W. (1991). *Water's way*. New York, NY: Scholastic, Inc.

Spier, P. (1982). *Rain*. New York, NY: Doubleday.

# The Water Cycle







# Notes

## OBJECTIVES:

The student will be able to:

1. State percentage of the amount of our Earth that is covered with water and compare the amount of water to the amount of land found on the Earth.
2. Create and read a pie chart.

## BACKGROUND:

What does the Earth look like to astronauts who circle thousands of miles above us in a rocket? What they see looks a lot like a large floating ball covered mostly with blue water. That's because oceans cover almost three-fourths of the Earth. Water, the most abundant resource on Earth, is irreplaceable. All the water that has ever existed on Earth, and all the water that will ever exist on Earth, is present today. Therefore, it is essential that it be carefully protected and cherished. Any study of water conservation, sea life, river life, or watersheds must begin with a student recognizing the importance and predominance of water on the Earth

## VOCABULARY:

**continent** - a large land mass

**globe** - a model of the Earth

**ocean** - the whole body of saltwater that covers nearly three-fourths of the surface of the Earth

## PROCEDURE:

### *Setting the Stage*

Begin with questions. Where do we live? We live in a city (or name the town in which your school is located). Where is this city/town? (In a state called Alabama). Where is Alabama? (In a country called the United States of America). Where is the United States of America? (On a giant land mass that scientists call a continent; the name of that continent is North America). Where is the continent of North America? (On a planet that scientists call Earth).

### *Activities*

1. Show the students the globe and explain that the globe is a model of the planet Earth. Some people have given Earth a nickname, the "Blue Planet". Whirl the globe on its axis and let the students discuss the reasons for Earth's nickname. Help students locate the large land masses (continents) and count them. Explain that the continents resemble huge islands that float in one big ocean. Show the different sections of ocean and explain how each section has a name, even though all water in every ocean flows together. Find the ice caps. Discuss the comparison of water and land on Earth. Show the students the blue on the globe represents all the water on Earth.
2. Give each student a round balloon to blow up and tie off. Tear many newspaper strips approximately one inch wide by six inches long. Mix three parts liquid starch to one part water and dip the newspaper strips into the liquid starch mixture then wrap the strips around the balloon. Wrap several layers smoothly around the balloon and then add the blue square strips of paper to represent the ocean. Allow to dry for several days then paint the hardened ball. Sponges cut by the teacher in shapes of continents may be dipped in

## Grades:

K-2

## Subjects:

Science, Social Studies, Art

## Time Needed:

30-45 minutes and 15-20 minutes daily on papier mache'

## Materials:

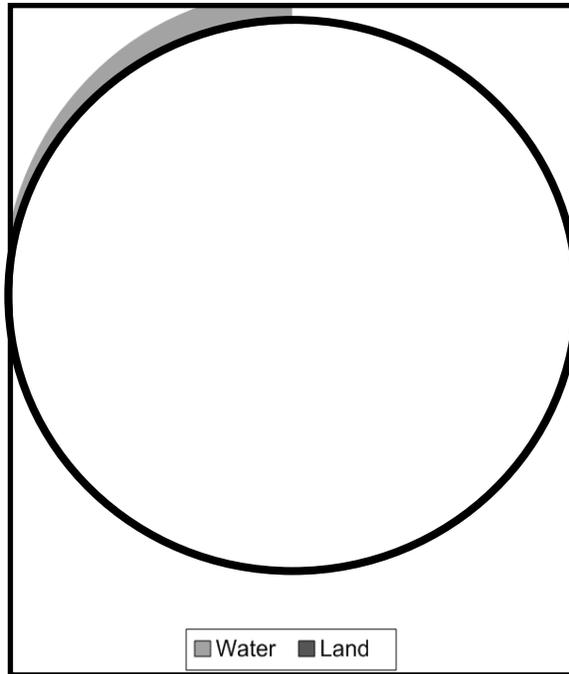
three 5"x5" sq. of blue paper  
sponges  
green and white acrylic paint  
paint brushes  
liquid starch  
newspaper  
balloons

green paint and printed on the dry ball. Use white acrylic paint to paint ice caps. Place a compass rose on your globe. Discuss.

3. The oceans vs. land. There are four oceans. The three largest oceans are the Pacific, the Atlantic, and the Indian. The Arctic is a smaller ocean. To show how much water there is on earth, follow the directions below:

1. Draw a circle on a piece of paper.
2. Use a pencil to divide the circle into four quarters.
3. Color one square (quarter) brown to represent land
4. Color the 3 remaining squares (quarters) blue to represent water.

Discuss the fact that all seven continents would fit into the largest ocean. The largest ocean (the Pacific) contains 46% of the Earth's water. (Idea: *Water Science* by Deborah Seed)



#### *Follow-Up*

1. Label the continents and oceans.
2. Have students compare the features of a globe to a map of the world.

#### **ORIGINAL DEVELOPMENT RESOURCES:**

Schwartz, L. (1990). *Earthbook for kids: Activities to heal the environment*. Santa Barbara, CA: The Learning Works.

# Air, Air Everywhere

## OBJECTIVES:

The student will be able to:

1. Observe that air is real and has weight.
2. Explain that air is matter.
3. Identify and name the properties of air.
4. Observe the effects that air has on objects.

## BACKGROUND:

Even though it can't be seen, air is a substance that takes up space and affects the way objects behave. Wind is air in motion.

## VOCABULARY:

**air** - the mixture of invisible, odorless, tasteless gases that surround the Earth

**wind** - air in motion

## ADVANCE PREPARATION:

1. Gather materials.
2. Prepare a parachute using a small ball, a string, and a two-foot square of cloth.

## PROCEDURE:

### *Setting the Stage*

Read *Gilberto and the Wind* by Marie Hall Ets. Discuss how Gilberto had fun playing with his friend, the wind. Tell the students that we are going to play with the air today.

## Grades:

K-2

## Subject:

Science

## Time Needed:

45-60 minutes

## Materials:

pan of water

balloons

plastic bag

straws

empty plastic bottle

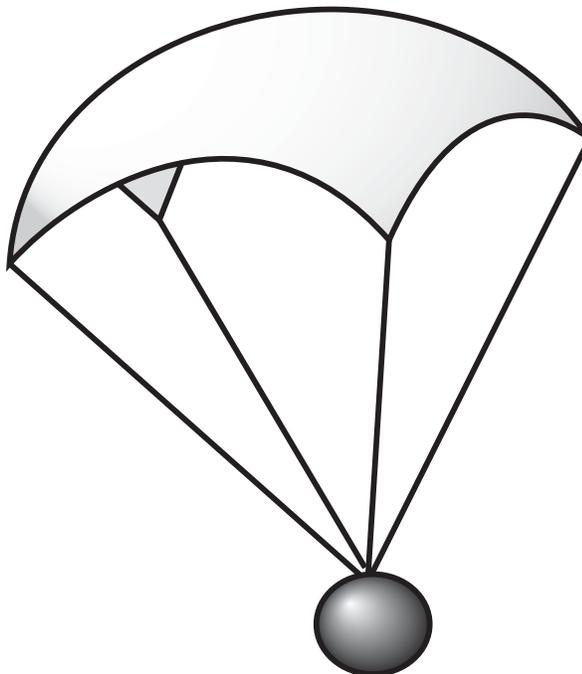
*Gilberto and the Wind* by Marie Hall

Ets

small balls for each student

16 inch square cloth

4 feet of string



## Activities

### Activity 1

1. Submerge an empty plastic bottle into a pan of water and watch the bubbles.
2. Blow up a balloon and put it under the water. Release the air in the balloon.
3. Allow the students to feel the air coming through a straw when they blow through the straw.
4. Allow the students to blow through the straw into the water.
5. Blow up a balloon. Place the mouth of the balloon onto the mouth of a deflated plastic bag and let the air escape from the balloon into the plastic bag.
6. Go outside and allow the students to throw small balls into the air and catch them. Now explain that if they had some way to catch some of the air, it would make a difference in the way the ball fell. Ask students to predict what will happen when you throw the prepared parachute into the air and write down their answers on a chart tablet. Throw your parachute into the air and observe it floating downward. Explain that the air will cause the parachute to fall slowly.

### Activity 2

1. Use different objects to tie on to the end of the parachute (made of 16 inch square of cloth, tied on the corners using the string). Find the objects you wish to use, sort the objects found at home into heavy / medium / light. Guess which objects will fall the fastest. Notice which objects falls more to the N / S / E / W? Measure the distance. Students drop parachutes as the teacher times the fall. Graph the results: heavy vs. light.

### Follow-Up

1. Following the air experiments, discuss the properties of air. Air takes up space and has weight. It can move and supply energy such as that used by a windmill or sailboat.
2. Older students can record predictions for each air experiment. These may be written or illustrated. Following the air experiments, have students record their outcomes.

## EXTENSIONS:

1. As an outdoor activity, take a large tub and fill with water. Place small plastic boats in the water and have students move them, using air. Students could also make boats from natural items such as leaves, flowers, or nut shells. This can also be a water table activity.
2. Have a boat race and/or a boat-design contest. Save the best from each year and use it with the new ones next year.
3. Put a small amount of soap and water into a cup so that each student has a cup of soapy water. Dip the end of the straw into the cup. Remove the straw, allowing the soapy mixture to drip once. Blow gently and produce a bubble. Talk about air being inside the bubble. Talk about how the bubble has different colors because light changes when it shines through the bubble. Ask the children to hypothesize why bubbles burst when they hit the ground.

## ORIGINAL DEVELOPMENT RESOURCES:

Brown, S. (1981). *Bubbles, rainbows and worms*. Mt. Ranier, MD: Gryphon House, Inc.

Ets, M.H. (1963). *Gilberto and the wind*. New York, NY: Viking Press.

Nickelsburg, J. (1976). *Nature activities for early childhood*. Phillipines, USA: Addison-Weslev Publishing Company.

# How We Use The Land For Fun And Profit

## OBJECTIVES:

The student will be able to:

1. Describe the many ways in which we use the land for fun and profit.
2. Identify the names of occupations and recreations that use the land.
3. Compare the terms occupation and recreation.

## BACKGROUND:

Some people use the land to make a living, while others use the land for fun and recreation. Each of these occupations and recreations may use a different part of the available land. Some people may have a place of their own to use, such as a farm. Others may borrow the land they use. People may need a variety of special clothes or special tools, depending on the tasks in which they are engaged.

## ADVANCE PREPARATION:

1. Copy enough activity pages for each student to use.
2. Cut a large piece of butcher paper for the class to use to make a mural.

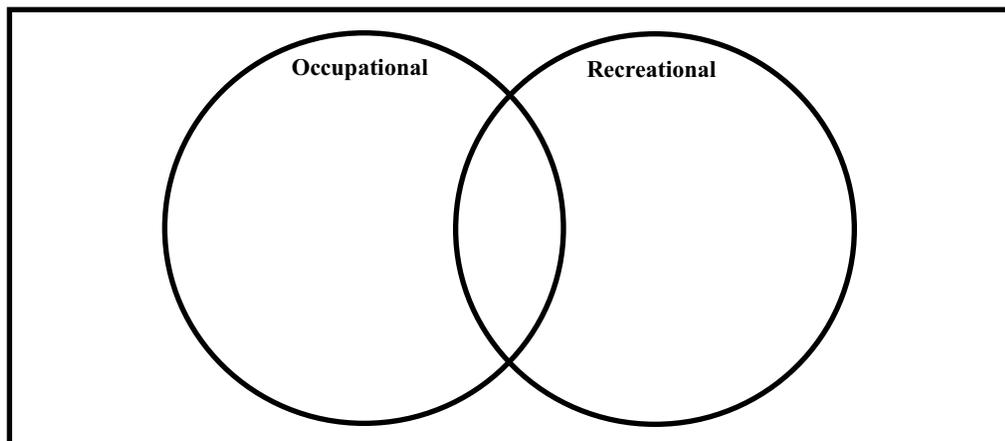
## PROCEDURE:

### *Setting the Stage*

1. Ask the student if they know any farmers, campers, hunters, fishermen, or others who use the land to make a living or to have fun.
2. Ask where these people work or play. What is the land like where they do this? Are there trees or not? Fences? Do they use any special equipment?

### *Activities*

1. Ask the students to choose a person to color, from the activity sheet.
2. Divide students into groups to work on the mural: some to make the farm, others to make the woods, mountains, and trails. They can use the old magazines to find trees and animals to add to their mural.
3. Make a Venn Diagram. Which mural did you choose? Occupational, recreational, or both?



## Grades:

K-2

## Subjects:

Social Studies, Language Arts

## Time Needed:

30 minutes

## Materials:

copies of activity sheet, "People Who Use the Land" for each student  
magic markers  
butcher paper  
old magazines  
paste or glue

4. Play the “How We Use the Land for Fun and Profit” game attached.

*Follow-Up*

Invite another class to come and see the mural. Have students from each of the groups describe their part in making the mural and explain what the people in their area are doing.

**EXTENSION:**

Have someone who works on the land, such as a farmer, gardener, or someone who works in recreation, visit the classroom to talk about the importance of keeping the land in good and useful condition.

**ORIGINAL DEVELOPMENT RESOURCES:**

Alabama State Park Brochures

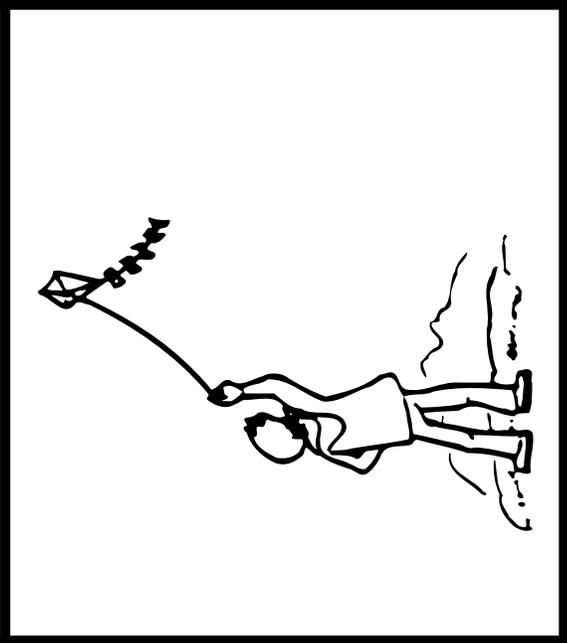
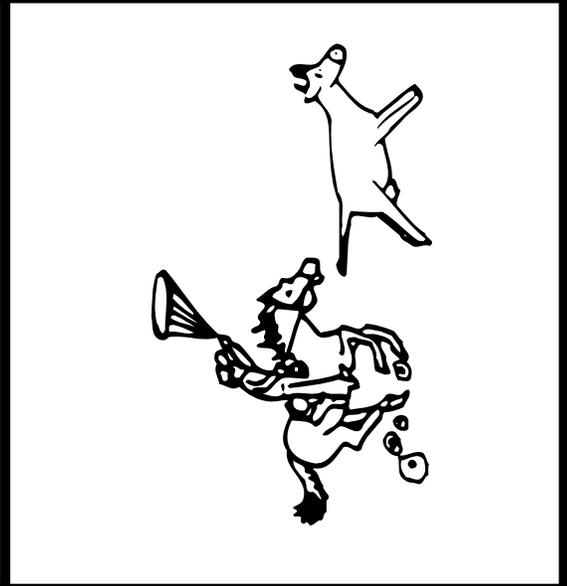
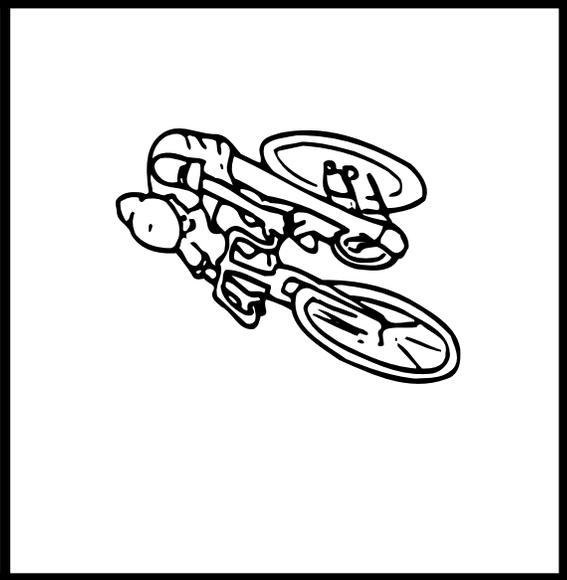
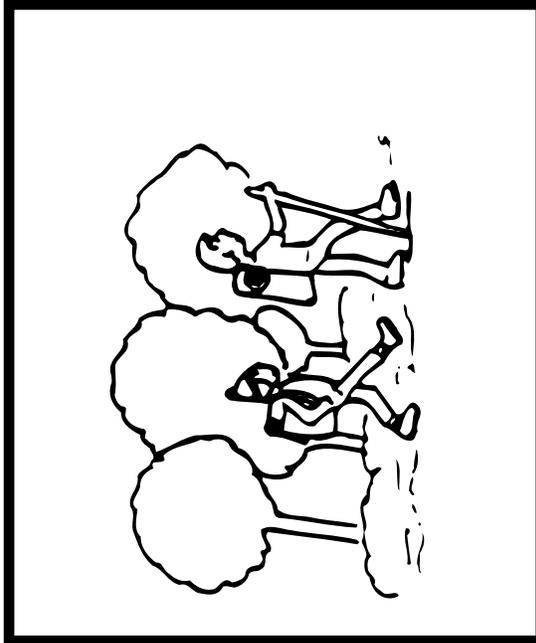
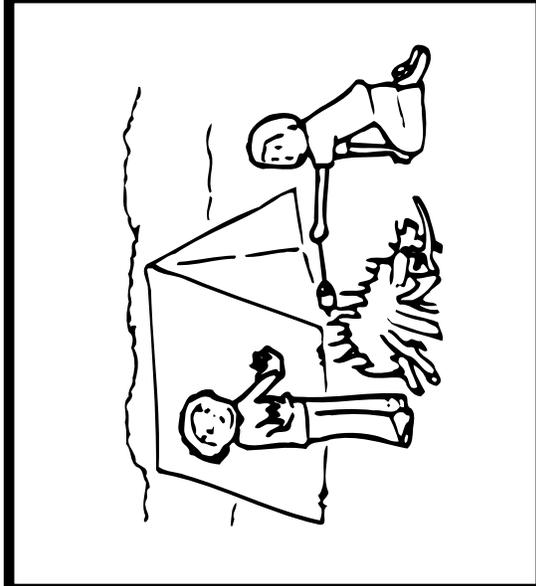
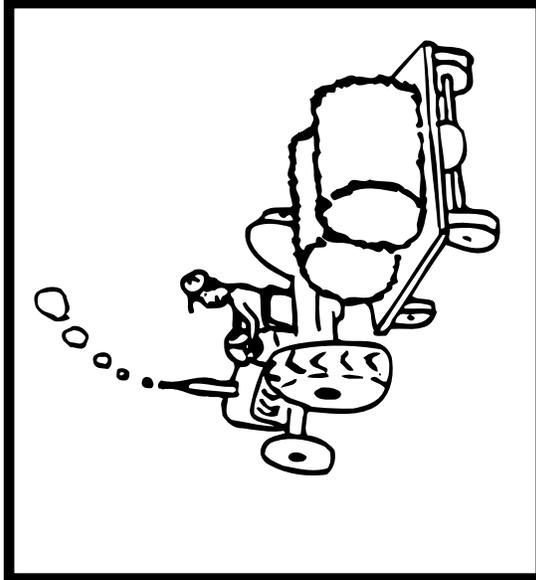
Flemming, B., Hamilton, M., & Hamilton, D.S. (1969). *Resources for creative teaching in early childhood education*. New York, NY: Harcourt, Brace, Jovanivich.

Harlan, J.D. (1976). *Science experiences for the early childhood years*. Columbus, OH: Charles E. Merrill.

*Peabody picture collection*. (1989). MN: American Guidance Service.

# People Who Use The Land

Lesson: How We Use The Land For Fun And Profit



# How We Use The Land For Fun And Profit

## Procedure

- \* Place the correct question cards on the correct title before starting the game.
- 1. Roll the dice to determine the number of the pocket from which a question must be asked.
- 2. Choose a team leader to read the questions.
- 3. If a player answers correctly, a point is given.
- 4. If the answer is incorrect, strip is returned to the pocket.
- 5. The winner is the person with the most points.

**FARMER**

**LOGGER**

**MOUNTAIN  
CLIMBER**

# Pick-A-Pocket

**HIKER**

**RANCHER**

**CAMPER**

# How We Use The Land For Fun And Profit

## Question Cards

I work the land every day. It is something I do for a living. I plant, tend, and harvest my crops. Is this an occupation or a recreation?

I cut down trees every day. I send the trees to a company which will make paper for you to write on. Is this an occupation or would this be for recreation?

I climb mountains every chance I get. I like to hike up the tall, giant mountains. I was trained by a coach. Do you think I do this exercise for fun or profit?

I bought myself some very good hiking boots. I go on very long hikes at least once a month. I love to do this activity but it is very hard work. Do you think this is an occupation for me or a recreational activity?

I raise cattle on a farm. I must get up at 5:00 am every day of my life. I take care of the cattle until they are old enough to sell. People buy my cattle to sell for food. Is this an occupation or recreation?

My family and I go camping in a tent. We do this several times a year. We have a great time on our trips. Do you think I do this for fun or for a profit?

I am a cotton farmer. Last year I made \$0.75 for each bag of cotton sold. The first week I made \$3.75 profit. How many bags did I sell? Would you say it is for fun or profit when you earn money for your work?

I earned \$0.50 for each tree I cut down. The first day I earned \$10.00. How many trees did I cut that day? I got paid for my work so was it for fun or for a profit?

I climbed 5 miles the first day. I climbed only 4 miles the second day. How many miles did I climb in 2 days? Do you know if a mountain climber does it for fun or profit? I didn't say I earned any money.

I hiked a total of 10 miles the first day but my friend hiked 15 miles. How many more miles did my friend hike than I did? Do you think my friend and I are doing this for fun or profit?

I am a cowboy on this cattle ranch. I counted 25 cows at first but on the second try I only counted 19. How many more cows did I count on the first try? Is this an occupation or recreation?

I put up tents for everyone last night. The rule for camping was three people to a tent. There were 15 people in all so how many tents did I set up? This sure was a lot of work. Did I do this for fun or profit?

# Notes

# Using Our Natural Resources For Agricultural Production

## Objectives:

The student will be able to:

1. Identify foods grown in Alabama.
2. Identify the food groups to which these foods belong.

## Advance Preparation:

1. If the classroom is located in a rural school district, some of the children's families may be involved in farming. It would be helpful to have this information in advance. Visit <http://www.choosemyplate.gov> for more info.
2. The posters of the four food groups should be posted on a table large enough to display a collection of foods.

## Procedure:

### *Setting the Stage*

1. Ask the students what crops are grown in Alabama and list these on the board. Add others they may not be aware of.
2. Explain to the students that they will be making a display of the different foods grown in Alabama. Pass out the list of foods and the request to parents.

### *Activities*

1. Ask the students to share the food they brought in and anything they may know about that food (answers may range from "I like it" to information about how a grandfather grows it).
2. Ask students to place the food group in the appropriate area on the display table.
3. Choose a student to put on Gregory (puppet attached). As the puppet character the student then reads the Direction Card.

Example:

Puppet: I'm Gregory from Alabama.

Student: I'm going to feed Gregory good foods that are grown in Alabama (student chooses foods and gives them to puppet etc.)

Students take turns reading Question cards from Gregory and following the directions on the card chosen. (Question Cards included)

### *Follow-Up*

1. The foods can be tasted and shared. The fruits can be made into fruit salad. Vegetables can be tasted raw and have the students compare them to their more common cooked texture.
2. Have students put each of the foods they are tasting into one of the four food groups. Discuss the reasons why.

## Extensions:

1. The students can be encouraged to think of other ways to group the foods. (Some are eaten raw and others are usually cooked; some grow on trees and some in the ground.)
2. Measure and weigh foods grown in Alabama. Predict which food would weight the most/least etc. Graph the results.
3. Predict which foods will float or sink. Place the food in water to test the predictions.

## Grades:

K-2

## Subjects:

Language Arts, Health

## Time Needed:

30 minutes

## Materials:

*Gregory and the Terrible Eater*

small teacher-made posters identifying the four basic food groups  
a list of foods grown in Alabama for each child to take home along with a request for each family to send in one of the food items to the classroom

## **ORIGINAL DEVELOPMENT RESOURCES:**

Alabama State Park Brochures

Flemming, B., Hamilton, M., & Hamilton, D.S. (1969). *Resources for creative teaching in early childhood education*. New York, NY: Harcourt, Brace, Jovanivich.

Harlan, J.D. (1976). *Science experiences for the early childhood years*. Columbus, OH: Charles E. Merrill.

*Peabody picture collection*. (1989). MN: American Guidance Service.

**Gregory  
Question Cards**

**Please tell me some good foods  
that are grown in Alabama & then  
feed me some of them.**

**I like to feel cotton. I also like  
to eat cotton. Do you eat cotton?  
Feed me some please.**

**Do you know which food group  
that apples would be in? Please  
tell me and then feed me some.**

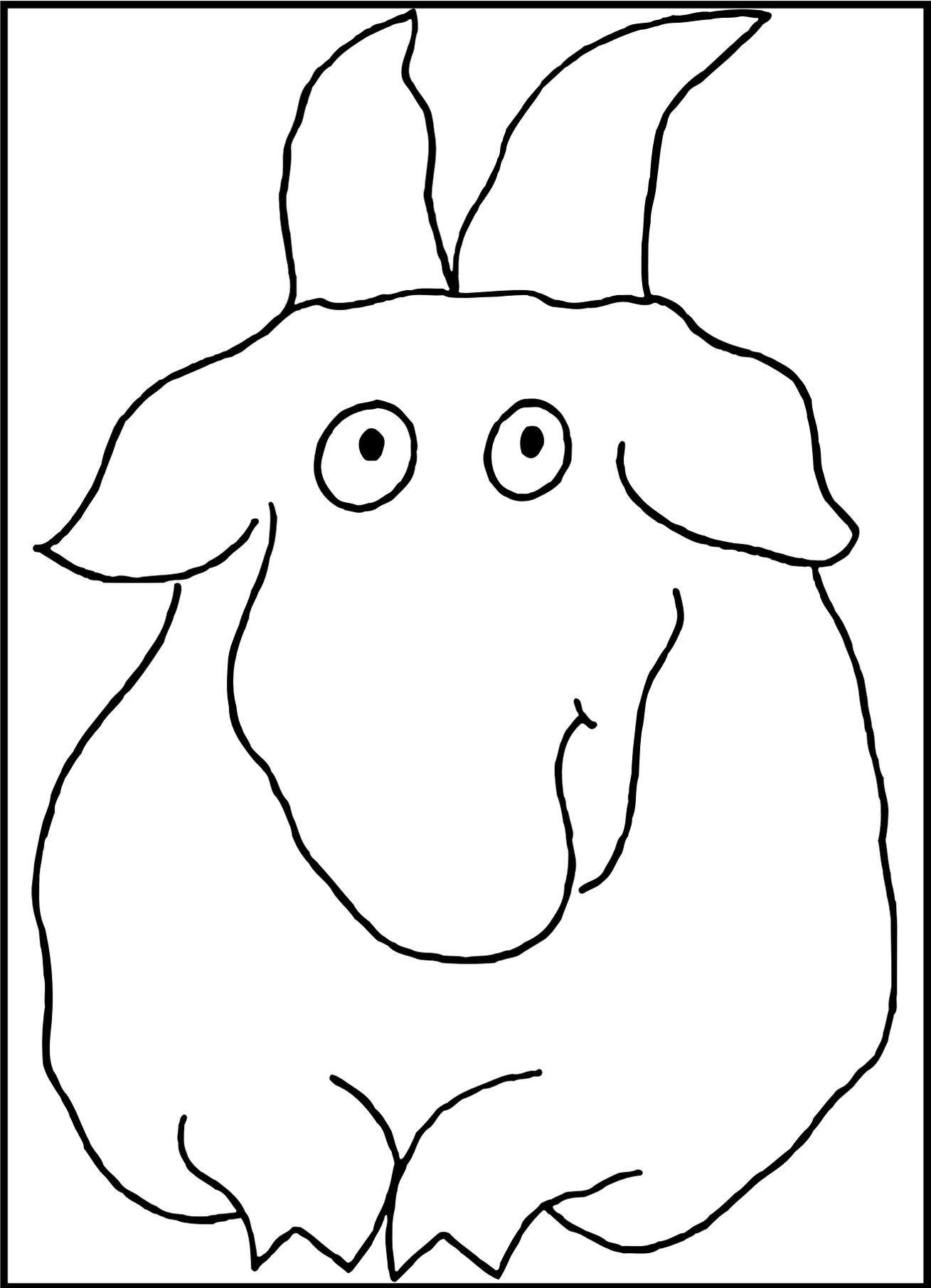
**Which food did you bring into the  
class to study? Tell me about it  
and I really should taste it!**

**I love peanuts & I heard your teacher  
say that they were grown in Alabama.  
I'll bet you could get me some but I eat  
mine with the shell.**

**Think of a red food that can be grown in  
Alabama. I grew some of these in my  
backyard. What about a little taste?**

**Name a food that you have studied this  
week and put it into the correct food  
group. Did you know that you are very  
smart?**

**I wish I had some corn. Do you know  
if this is grown in the state of Alabama?  
If it is, could you direct me to the corn  
field? I am very hungry.**



## OBJECTIVES:

The student will be able to:

1. Identify cotton as an important crop grown in Alabama
2. Identify garments that are made from cotton.

## BACKGROUND:

Cotton is an important natural resource in Alabama. Many items are made from cotton. Cotton grows on a plant and is cultivated in fields. The cotton fibers come from the seed pod. This fiber is used to make clothes, sheets, cotton balls, and other things. The cotton seeds are pressed to make oil, and the cotton seed hulls are used as mulch.

## ADVANCE PREPARATION:

If the classroom is located in a rural school district, it may be possible to get some pieces of a cotton plant to display. It would be helpful to have a selection of garments made of cotton for the students to see and feel.

## PROCEDURE:

### *Setting the Stage*

1. Ask the students what their clothes are made of. Help them become aware of the tag in the garment that identifies the material.
2. Show the students the collection of garments that are made of cotton. Let them feel the fabrics and identify each garment by name.
3. Ask students if they have seen cotton growing in a field. Show pieces of a cotton plant if available.
4. Explain how cotton grows through the growth process from a seed to an adult plant.

### *Activities*

1. Ask the students to look in the magazines for pictures of garments or other products that could be made of cotton.
2. Ask them to cut the cotton products out of the magazine and glue them onto the pieces of poster board for a classroom display.
3. Find out which students have on cotton clothing. Graph the results. Question : Do I have on cotton today?
4. Compare cotton to all different types of material.
5. Predict the number of seeds that are inside the picked cotton. Encourage the children to count the actual seeds.

## EXTENSION:

Possible field trip to extend this concept is:

- A trip to a cotton gin.

## Grades:

K-2

## Subjects:

Language Arts, Social Studies, Math

## Time Needed:

30 minutes

## Materials:

old magazines

scissors

glue

several large pieces of poster board

pieces of a cotton plant (if available)

several different fabric samples

# Notes

## OBJECTIVES:

The student will be able to:

1. Explain how peanuts grow.
2. Identify ways we eat and use peanuts.
3. Recognize peanuts as a cash crop in Alabama.

## BACKGROUND:

Peanuts are a valuable cash crop in Alabama. Alabama supplies the basic needs peanuts must have for successful growth: sandy soil, and long hot summers. Peanuts are a type of legume, like peas and beans, that grows in a pod. The main difference is that peanuts grow in pods underground. When farmers harvest peanuts, they must use a special machine called a “digger,” which digs up the peanut plant. It turns them upside down on the ground so they will dry. Then another machine called a “combine” cuts the peanuts off the plant. Peanuts are then used to make peanut butter, a stable source of protein that many children love.

## PROCEDURE:

### *Setting the Stage*

If possible, show students a whole peanut plant that has been pulled up to dry with the peanuts still attached. Ask students if they know what it is. Have them name as many things made with peanuts as they can. Explain that Alabama grows many of the peanuts that supply children throughout the country with peanut butter and other peanut products. A famous Alabamian is George Washington Carver. Dr. Carver was a professor at Tuskegee Institute and developed many products from the peanut.

### *Activities*

1. On the chalkboard or overhead projector, outline the steps of growing and harvesting peanuts.
  - Plowing and planting
  - Checking the crops for growth and insect problems
  - Harvesting - Digging up the peanuts to dry, using a digger; using a combine to cut the peanuts off the plant
2. Have a peanut tasting party. Let children taste a wide variety of peanuts: raw, boiled, honey roasted, salted, and fried. If you have an electric skillet, use a little oil and salt to fry raw peanuts. Fry about five to seven minutes.
3. After students have had the opportunity to taste the peanuts, survey the class and see which kinds they liked the most. Use the chart or floor graph divided into categories according to how peanuts were prepared to record responses. They might glue or tape on peanut shells to mark the graph. Examine the graph and see which kind of peanuts students liked the most and least.

### *Follow-Up*

1. Give each student several empty shells to examine. Ask them to look at the shells and see if they can imagine them as a landform. What kind of land do you see - mountains, hills, valleys?
2. Let students use the peanut shells to make a picture or person. Have them glue the shells on paper and use crayons or markers to add features and a background.
3. Have students write or dictate sentences about the growth and harvesting of peanuts. Divide the students into cooperative groups to illustrate the process and hang it in sequence as a mural.

## Grades:

K-2

## Subjects:

Science, Social Studies, Math, Music

## Time Needed:

60 minutes

## Materials:

various kinds of peanuts: whole, raw, boiled, honey roasted, salted  
peanut shells  
electric skillet  
graphing chart or floor graph

4. Find facts about the peanut - open the shell, take out peanuts, place a fact inside, reclose, and tape shut. Children then take turns reading their peanut facts to each other. Also place add and subtract problems inside the peanuts.

## **EXTENSIONS:**

1. Discuss the process of making peanut butter from peanuts.

Make peanut butter.

- 2 cups of roasted peanuts with shells and skins removed.
  - Pour peanuts into blender.
- Add 4 teaspoons of vegetable oil.
- Add 1 teaspoon of salt
- Blend in blender until smooth

2. Sing the chant :

### **“Peanut Butter”**

REFRAIN: Peanut-Peanut Butter Jelly  
Peanut-Peanut Butter Jelly

First you take the peanuts and you pick'em, you pick'em, you pick'em, pick'em, pick'em.  
Then you take the peanuts and you crack'em, you crack'em, you crack'em, crack'em, crack'em.

REFRAIN

Then you take the peanuts and you crush'em, you crush'em, you crush'em, crush'em, crush'em.  
Then you take the peanuts and you spread'em, you spread'em, you spread'em, spread'em, spread'em.

REFRAIN

Then you take the jelly and you spread it, you spread it, you spread it, spread it, spread it.  
Then you take the sandwich and you smush it, you smush it, you smush it, smush it, smush it.

REFRAIN

Then you take the whole thing and you eat it, you eat it, you eat it, eat it, eat it.

## **ORIGINAL DEVELOPMENT RESOURCES:**

Armento, B.J., Nash, G.B., Salter, C.L., & Wixson, K.K. (1991). *Some people I know*. Atlanta, GA: Houghton Mifflin Company.

Westcott, N.B. (1987). *Peanut butter and jelly: A play rhyme*. New York, NY: Dutton's Children's Books.

Nelson, M. (2002). *Carver: a life in poems*. New York, NY: Front Street.

# Questions for Peanut Shell Activity

1. Where are peanuts grown in the United States?  
a. North      b. South      c. East      d. West
2. What part of the plant grows from the flower into the ground?  
(It is like a vine.)  
a. stem      b. shoot      c. peg      d. leap
3. Name one thing a peanut needs in order to grow?  
a. sunlight      b. grocer      c. South
4. How many used did Dr. Carver find for peanuts?  
a. 25      b. 100      c. 300
5. Where do peanuts grow?  
a. above ground      b. below ground
6. Which one of these states grows peanuts?  
a. Georgia      b. New York      c. Oregon
7. How many peanuts are grown every year?  
a. millions of tons      b. millions of pounds      c. hundreds of tons
8. What is another name for peanuts?  
a. rollers      b. goobers      c. ground peas
9. The protein in peanuts gives you energy. Where does it come from?  
a. shell      b. oil      c. nut

# Notes

# Glossary

**aerate** - to cause air to circulate through

**air** - the mixture of invisible, odorless, tasteless gases that surround the Earth

**aphid** - a small insect that sucks the juice of plants

**aquatic** - growing or living in or upon water

**bacteria** - microscopic, one-celled organisms. Most act as decomposers.

**bay** - a place in which a small body of water is set off from the main body of water and has land on three sides

**beach** - an expanse of sand or pebbles along a seashore

**beneficial insect** - one that eats harmful insects

**biodegradable** - waste that can be decomposed by bacterial action

**biodegradables** - material that can be broken down naturally

**bivalve** - shells that have two pieces hinged at the back

**bulk buying** - purchasing a particular item in large quantities

**camouflage** - the means or result of disguising things to deceive an enemy

**campus** - the grounds of a school

**chlorophyll** - the green pigment of leaves and plants

**chrysalis** - a case or hard covering a caterpillar sleeps in while it is changing into a butterfly

**clouds** - mass of vapor in the sky

**collection station** - a facility where recyclables are collected and processed for the market

**compost** - a mixture of plant and food waste used to fertilize the soil

**compostable** - organic materials that will break down or decompose naturally and can be used as an organic fertilizer to enrich the soil

**condensation** - process of turning vapor to liquid

**coniferous tree** - a tree that has cones and is mostly evergreen

**contaminant** - an impurity that causes air, soil, or water to be harmful to living organisms or the environment

**continent** - a large land mass

**crab** - a sea animal that has a hard shell and paddle-shaped back legs to help it swim

**decay** - to break down while rotting

**deciduous tree** - a tree that sheds leaves during a particular season

**decompose** - to decay or rot from a process of microbial action

**decomposition** - the process of decaying or rotting

**dependent** - needing something else for support to live

**disposables** - products designed to be thrown away after use; will be incinerated or sent to a landfill

**dispose** - to get rid of or throw away

**dune** - mound of sand usually covered with plants, formed by winds carrying sand into vegetated areas of the beach; forms slopes of the beach that are important to the slowing of incoming water

**echolocation** - the process of locating objects with sound waves

**ecosystem** - a system dealing with the interrelationships of organisms living in one environment

**environment** - the world around us including water, land, air, and food

**endangered** - in danger of extinction

**eroding** - land that is worn or washed away

**erosion** - the wearing away of the land surface by running water, wind, or ice

**evaporation** - the process of turning liquid to vapor

**evergreen** - trees with green leaves all year

**extinct** - complete disappearance of a species

**fact** - something known to be true

**fertilizer** - chemicals applied to crops and lawns that can be washed out of the air and soil and into our water supply

**fiction** - something made up or imaginary

**filtration** - the process of separating matter from a liquid

**flounder** - a type of flatfish that lives in the ocean

**fog** - water vapor obscuring vision

**fossil** - hardened or petrified plant or animal; a remnant impression, or trace of an animal or plant of past geological ages that has been preserved in the Earth's crust

**fossil fuel** - fuel found underground that is usually formed from dead plants and animals; fossil fuels include coal, crude oil, and natural gas

**freeze** - to harden into a solid (as ice) by loss of heat

**globe** - a model of the Earth

**Greenhouse Effect** - accumulation of heat in the lower atmosphere through the absorption of longwave radiation from the Earth's surface.

**ground cover** - plants that cover the surface of the Earth

**gulf** - a body of water that is an extension of an ocean or sea

**habitat** - the place in nature where plants and animals live

**hazardous waste** - waste from chemicals that are poisonous to the environment

**homebuilder** - someone who builds houses

**jellyfish** - simple animals made of jelly-like tissue that float on the ocean surface

**junk mail** - mail received that is unwanted by the occupant

**landfill** - a large outdoor area designed for waste disposal; sanitary landfills are lined with plastic and covered daily with dirt to prevent garbage from polluting surrounding land and water

**larva** - the immature, wingless, feeding stage of an insect that undergoes complete metamorphosis

**litter** - trash, wastepaper, or garbage lying scattered about

**meadow** - area of grassy land

**metamorphosis** - a change in form, structure, or function as a result of development

**micro-organism** - plant or vegetable organism too small to be seen without a microscope

**mountain** - a landmass higher than a hill

**mulch** - protective ground cover, including manure, wood chips, straw, seaweed, leaves, and other natural products, or synthetic materials, such as heavy paper or plastic, that protect the soil, save water, and prevent weed growth

**nectar** - the sweet secretion of a plant which attracts the insects or birds that pollinate the flower

**nest** - a structure of twigs, grass, and mud formed by a bird as a place to lay and incubate its eggs and raise its young

**noise pollution** - sound that is annoying and may cause hearing loss

**ocean** - the whole body of saltwater that covers nearly three-fourths of the surface of the Earth

**opinion** - what someone thinks or believes about something

**organic** - formed from living matter

**packaging** - the wrapper or container covering many items for sale

**phosphate** - chemicals added to detergents to produce suds

**photosynthesis** - process by which chlorophyll containing plants exposed to sunlight produce carbohydrates (sugars)

**pollen** - the fertilizing element of flowering plants consisting of fine, powdery, yellowish grains or spores

**pollutant** - a substance that can harm water, air, land, or living organisms

**pollution** - contamination of the environment with man-made waste

**pond** - a small body of water

**precipitation** - condensed moisture that falls back to Earth

**predator** - habitually preying upon other animals for food

**prehistoric** - pertaining to time before recorded history

**prey** - an animal hunted or seized for food

**products** - something produced by nature or by people that we use

**pupa** - an insect in the nonfeeding, usually immobile, transformation stage between the larva and the adult stage

**radioactive** - material that can damage or destroy living cells

**recyclables** - useful materials from garbage or waste that are used again and reprocessed

**recycling** - reprocessing of discarded materials into new, useful products; not the same as reuse of materials for their original purpose, but the terms are often used interchangeably

**reduce** - to make smaller in any way such as size or weight

**reuse** - to use again for the same or different purpose

**rhythm** - a beat that accompanies music

**roosts** - groups bats live in

**sand dollar** - a round hard sea animal that lives in the sand of the ocean floor

**scales** - thin plates that cover the body of a fish

**sea horse** - a tiny fish whose head looks like a tiny horse

**sea urchin** - a sea animal that is covered with prickly spines

**seed** - a small structure from which a plant or tree grows

**shoreline** - the place where water and land meet

**slope** - at an angle, the rise or descent of the Earth's surface

**soil** - part of the environment and Earth surface that is made up of mineral materials from rocks, partially decayed materials, and living organisms

**solid waste** - any discarded material that is not liquid or gas

**source reduction** - to use less to begin with at the place where waste is produced

**sour** - acid tasting

**steam** - gaseous or vaporized water

**starfish** - a star-shaped sea animal that lives in or on the sand of the ocean floor

**surface erosion** - the wearing away of the Earth's surface by wind or water

**tertiary dune** - the largest dune located the greatest distance from the shoreline; forms the border of the beach area

**toxic** - poisonous substance harmful to living organisms

**transfer station** - a facility where garbage is collected before being taken to the landfill.

**trash** - waste that is of no use and should be disposed of in a landfill

**univalve** - shells that have one piece

**vapor** - gaseous substances such as steam or mist

**vegetation** - all the plants or plant life of a place

**waste** - that which is no longer wanted

**wind** - air in motion



# Internet Resources

## *What is the Internet?*

The Internet is a network of networks. In many ways, it is no one thing and resides in no one place. Teachers can use the Internet to communicate and share information. Research suggests that use of electronic networking can help teachers (especially new teachers) reduce their sense of isolation, connect with peers, and increase their sense of professionalism and autonomy. This section explores the uses of the Internet for the purposes of Environmental Education.

## *E-mail*

Electronic mail (E-mail) is the most frequently used of the Internet networks. Users are able to participate in discussion groups, contact particular people, and access information. The most helpful of sources of information are usually your own colleagues. E-mail provides another way to keep in touch with them within your school or around the world.

Internet discussion groups are an extension of electronic mail and provide an opportunity to be part of an electronic community made up of individuals with common interests. Mailing list capability may also provide online courses, which are often advertised on discussion lists.

General discussion groups for the grade level that you teach are very useful for a wide range of information. During some times of the year, such as the period near Earth Day, there will be some discussion on environmental topics and curriculum that you may find useful. You can also pose questions to these discussion groups; and your colleagues will answer, providing information about where to find resources and how other teachers at your level handle particular issues and opportunities. These general discussion groups are called 'listservs'.

Listservs can be found on the world wide web at:

<http://www.list.com>

This list may provide you with a forum that most nearly meets your specific interests. You can enter keyword terms and get information about any list that would meet that interest. Information is provided on how to subscribe to the many diverse listservs that are available,

Once you have found an interesting listserv, send an E-mail message to subscribe. On the address line, type in `listserv@listserv.net`

On the message line, type in Subscribe, the name of the list, and your name. A sample message would read:

Subscribe ECEOL-L Jane Doe

(ECEOL-L is a listserv that serves members of the early childhood profession)

Once you have subscribed, it is appropriate to send a message to the list identifying yourself and your major interest.

EENETS is a moderated forum for people interested in the development and operation of electronic networks for environmental education. It does not post all messages sent to the group but only selected messages that will be of interest to all subscribers. The volume of mail you receive is, therefore, much lower and much more focused than on a general discussion group. The creation of this list was suggested at the Eco-Ed conference in Toronto in 1992. This list is an attempt to help coordinate information about projects and networks that are

of interest to educators. It is useful to subscribe to EENETS in order to obtain information about other discussion groups, on-line journals, and environmental meetings.

AskERIC is an internet answering service sponsored by ERIC (the database of the Educational Resources Information Center). AskERIC can provide information about specific resources for parents, teachers, and children. Requests for information should be sent by E-mail to:

[askeric@ericir.syr.edu](mailto:askeric@ericir.syr.edu)

The GreenDisk Paperless Environmental Journal is a comprehensive guide to the use of computers for environmental research. It contains over 1,000 listings of World Wide Web sites, listservs, on-line databases, bulletin board services, software, and educational programs. It is available on disk for IBM or Macintosh format and includes keyword searching as well as a six-month on-line subscription to updates for the guide. It can be ordered for \$25.00 from :

The GreenDisk Paperless Environmental Journal  
P.O. Box 32224  
Washington, D.C. 20007

or by internet from [greendisk@igc.apc.org](mailto:greendisk@igc.apc.org)

### ***World Wide Web***

There are many information collections on the World Wide Web (WWW) that contain full text of articles, lesson plans, and documents. There is often information on projects for children to participate in with their peers in other parts of the world, information from many government documents, and information from many cultures. Many sites have interesting graphics and interactive activities.

The following sites have specific information that is of interest to environmental educators. In each case, teachers should check out the site beforehand to decide which of the many resources available might fit into a lesson and ways to use them. Since the WWW is developing rapidly, these resources are only a suggested starting point and will contain links to many other interesting sites.

### ***ALABAMA RESOURCES***

AlaWeb - AlaWeb, the official state home page, has information on campgrounds, golf courses, tours, and other helpful information about the state. Available at:

<http://alaweb.asc.edu/> or [www.state.al.us](http://www.state.al.us)

Alabama Information Resources - This is an electronic information guide to "The Heart of Dixie, Alabama." Allows users from anywhere in the world to access information about the history, sites, and culture of Alabama. Available at:

<http://www.secis.com/home/ala.html>

Official Alabama Pages - These include pages for individual cities, Alabama conventions, visitor bureaus, travel and tourism offices. Available at:

<http://www.scescape.com/cityweb/Alabama.html>

Alabama Game and Fish Homepage - Conservation Education Programs; clickable map of public hunting areas; hunter education program. Available at:

<http://www.mindspring.com/~spinson/ag&f.html>

## ***OTHER RESOURCES***

Explorer, a searchable catalog of curricular resources for math and science education; TEXT files on energy, water, and waste management; Energy Education Resource Guide, School Nature Area Project Bibliographies with separate lists for primary and secondary school resources for investigating schoolyard ecology; Water Quality Curricula. Available at:

<http://www.nceet.sure.umich.edu/classes.html>

Many environmental resources can be found at:

<http://www.webdirectory.com/Education/>

EE-Link - Provides a keyword search, classroom resources, and regional information. Provides table of contents and monthly updates. Also the EnviroLink Education Network and the Environmental Education Network

Commonwealth of Learning - Includes Teacher In-service on Environmental Education; Video on sustainable development; Professional Development. Available at:

<http://www.col.org/envir.html>

Econet Environmental Education Directory - Provides a Global Action and Information (GAIN), which supports and encourages actions for a sustainable society. Available at:

<http://www.igc.apc.org/igc/www/enved.html>

Scroll down to find these sites:

Dodo Land in Cyberspace: an interactive, educational centre for kids: "Protect the Environment and Expand Your Imagination." There are lots of images here, so you may want to use it with a fast connection.

The Environment and Natural Resources Policy and Training Project Resources for teachers. You can find the latest information about energy, industry, forestry, and watershed management.

Two interesting project sites for children at this address are :

The Global Thinking Project, which is a world-wide E-mail project for students and teachers to work with scientists to understand the global environment.

The International Education and Resource Network (I\*EARN) is a site for teachers and youth (ages 6 to 19) to undertake projects via E-mail.

Ranger Rick of the National Wildlife Federation is also available from this site, or [www.nwf.org](http://www.nwf.org)

Environmental Organizations and Projects - There is a listing at <http://www.ncet.snre.umich.edu/> that has electronic brochures for many organizations related to environmental education.

Institute for Global Environmental Strategies - EarthRISE is under development at this site:

<http://www.strategies.org/>

Internet Resources for Outdoor Recreation Research - This has many on-line resources and many links to others. It includes Tourism, Ecological Aspects of Outdoor Recreation, Recreational Issues on Public Lands.

Available at:

<http://www.vt.edu:10021/Y/yfleung/recres.html>

Learning Webs - This is a consulting service in the field of environmental education specializing in Arizona. Services available are fund raising (t-shirts, note cards, pens with environmental themes) educational resources, and an AzEENet Magazine, a look at environmental publishing on the web. Available at:

<http://www.nwf.org/nwf/prog/things.html>

Nationwide School Weather Network - Your children can keep track of the weather across the nation at this site. Available at:

[emailatinfo@aws.com](mailto:emailatinfo@aws.com)

or go to <http://www.webdirectory.com/Education/> and choose the Automated Weather Source

The Plastic Bag Information Clearinghouse - This has much information about recycling, teaching aids, an essay contest. Available at:

<http://www.plasticbag.com/>

or by email at [pbainfo@aol.com](mailto:pbainfo@aol.com)

Regional Environmental Education Resources - This site has information about environmental programs and curricula listed by state. It includes a wealth of valuable information for teachers. Available at:

<http://www.nceet.snre.umich.edu/regionalEE.html>

State Education and Environment Roundtable - This is working to improve learning by incorporating environmental curricula into K-12 education. "A major part of our work relates to gathering and disseminating research about systemic approaches to incorporating environmental education into education reform."

Available at:

<http://millennianet.com/round>

Stay up-to-date with what's new in environmental education on the World Wide Web at EE-Link. Available at:

<http://www.nceet.snre.umich.edu/new.html>

The Wild Ones Home Page - This will post your children's art work, writings and experiments related to the environment on the Internet web pages. Send work by fax to (212) 222-2191 or regular mail to:

The Wild Ones

c/o Wildlife Preservation Trust International

3400 West Girard Ave

Philadelphia, PA 19104

Windows on the Wild - or WOW, is an environmental education program of the World Wildlife Fund (WWF). The program educates the public about biodiversity issues and helps to stimulate critical thinking on behalf of the environment. It includes many activities for teachers to use in the classroom.

[www.worldlife.org](http://www.worldlife.org)

# Directories

## ECOLOGY

### Federal Government Organizations

Advisory Committee on Atmospheric Carbon  
Dioxide  
U.S. Dept. of Energy  
Washington, D.C. 20585

Bureau of Reclamation (U.S.)  
Main Interior Building  
18th and C St., NW  
Washington, D.C. 20240  
202-343-4662

Environmental Protection Agency (U.S.)  
401 Mst., SW  
Washington, D.C. 20460  
202-382-2080

Environmental Protection Agency (U.S.)  
Public Information Center, PM-211 B  
401 Mst., SW  
Washington, D.C. 20460

Federal Energy Regulatory Commission  
Department of Energy  
815 N Capitol Street  
Washington, D.C. 20426  
202-357-8118

Fish and Wildlife Service (U.S.)  
Department of the Interior  
Main Interior Building  
Washington, D.C. 20240  
202-343-5634

House Energy and Commerce Committee  
U.S. House of Representatives  
Washington, D.C. 20515  
202-255-2927

House Agricultural Committee  
U.S. House of Representatives  
Washington, D.C. 20515  
202-255-2171

National Marine Fisheries Service  
Department of Commerce (U.S.)  
1335 East-West Highway  
Silver Springs, MD 20910  
301-427-2370

National Park Service  
Main Interior Building  
Washington, D.C. 20240  
202-343-4747

Office of Conservation and Renewable Energy  
1000 Independence Ave., SW  
Washington, D.C. 20585  
202-586-9220

Save Our Streams Program  
Izaak Walton League of America  
707 Conservation Lane  
Gaithersburg, MD 20878

Senate Environment and Public Works Committee  
U.S. Senate  
Washington, D.C. 20515  
202-224-6176

Topographic Maps  
U.S. Geological Survey  
Box 25286  
Denver Federal Center  
Denver, CO 80225

Topographic Map Symbols  
U.S. Geological Survey  
National Center  
Reston, VA 22202

### EPA Regional Offices

U.S. EPA - Region 1  
JFK Federal Building  
Boston, MA 02203  
617-565-3715

U.S. EPA - Region II  
26 Federal Plaza  
New York, NY 10278  
212-264-2525

U.S. EPA - Region III  
841 Chestnut St.  
Philadelphia, PA 19107  
215-597-9800

U.S. EPA - Region IV  
345 Courtland St., NE  
Atlanta, GA 30365  
404-347-4727

U.S. EPA - Region V  
230 South Dearborn St.  
Chicago, IL 60604  
312-353-2000

U.S. EPA - Region VI  
First Interstate Bank Tower  
1445 Ross Ave.  
Dallas, TX 75270-2733  
214-655-6444

U.S. EPA - Region VII  
726 Minnesota Ave.  
Kansas City, KS 66101  
913-551-7050

U.S. EPA - Region VIII  
One Denver Place  
999 18th St.  
Denver, CO 80202-2405  
303-293-1603

U.S. EPA - Region IX  
1235 Mission St.  
San Francisco, CA 94103  
415-744-1468

U.S. EPA - Region X  
1200 Sixth Ave.  
Seattle, WA 98101  
206-442-5810

U.S. Fish and Wildlife Service  
SE Regional Office  
Richard B. Russell Fed. Building.  
75 Spring St., SW, Room. 1200  
Atlanta, GA 30303

### **Alabama State Agencies/Organizations**

Alabama Audubon Council  
2616 Mountain Brook Parkway  
Birmingham, AL 35223  
205-879-1935

Alabama Department. of Education  
50 N. Ripley  
Gordon Persons Building.  
Montgomery, AL 36130  
334-242-9700 or 334-242-8154

Alabama Energy Extension Service  
Box 6282  
University, AL 35486  
1-800-452-5901

Alabama Power Company  
Educational services  
P.O. Box 2641  
Birmingham, AL 35282-9984

Alabama Waterfowl Association  
P.O. Box 67  
Guntersville, AL 35768  
205-259-2509

Alabama Wilderness Alliance  
P.O. Box 223  
Moulton, AL 35650  
205-974-7678

Alabama Wildlife Federation  
P.O. Box 2102  
46 Commerce St.  
Montgomery, AL 36102  
334-832-9453 fax: 334-532-9454

Alabama Wildlife Society  
118 Extension Hall  
Auburn, AL 36849  
205-844-5670

Alabama Zoological Society  
2630 Cahaba Rd.  
Birmingham, AL 35223

Audubon Society  
749 Eastern Manor Lane  
Birmingham, AL 35215  
205-849-9202

Bankhead Watershed Project  
P.O. Box 117  
Moulton, AL 35650  
205-974-7678

Center for Environmental Research and Service  
Troy State University  
Troy, AL 36081  
334-566-4424 or 1-800 642-2377

Environmental Education Association of Alabama  
Troy State University  
Box 596  
Troy, AL 36082

Department. of Conservation and Natural Resources  
64 N Union St.  
Montgomery, AL 36130  
334-261-3486

Department. of Environmental Management.  
1751 W.L. Dickinson Dr.  
Montgomery, AL 36130  
334-271-7700 fax: 334-271-7950

Geological Survey of Alabama  
State Oil and Gas Board  
420 N. Hackberry Lane  
Tuscaloosa, AL 35486-9780  
205-349-2852

Johnson Research Center - AL Solar Energy Center  
University of Alabama in Huntsville  
Research Institute/Annex D  
Huntsville, AL 35899  
1-800-228-5897

Marine Environmental Sciences Consortium  
Dauphin Island Sea Lab  
Attention: Dr. George Crozier, Director.  
P.O. Box 369-370  
Dauphin Island, AL 36528  
334-861-2141

Perdido Bay Environmental Association  
P.O. Box 573  
Lillian, AL 36549  
334-962-2879

Science, Tech. and Energy Division.  
Dept. of Eco. and Community Affairs  
P.O. Box 205347  
Montgomery, AL 36125-0347  
334-284-8952 or 1-800-392-8098

Shoals Audubon Society  
1612 Sheffield Dr.  
Sheffield, AL 35660  
205-383-6338

U.S. Fish and Wildlife Service  
P.O. Drawer 1197  
Daphne, AL 36526  
334-690-2181

Water Resource Res. Institute  
Hargis Hall, Room 202  
Auburn University, AL 36849  
205-826-5075

### **Other Environmental Agencies/Organizations**

Abundant Life Seed Foundation  
P.O. Box 772  
Port Townsend, WA 98368  
206-385-5660

Acid Rain Foundation  
1410 Varsity Dr.  
Raleigh, NC 27606  
919-828-9443 fax: 919-515-3593

Alliance for Environmental Education  
P.O. Box 368  
The Plains, VA 22171  
703-253-5812 fax: 703-253-5811

Alliance to Save Energy  
1725 K St. NW, Suite 509  
Washington, D.C. 20006  
202-857-0666 fax: 202-331-9588

American Fisheries Society  
5410 Grosvenor Lane, Suite 110  
Bethesda, MD 20814-2199  
301-897-8616 fax: 301-897-8096

American Forests - Global Releaf Program  
P.O. Box 2000  
Washington, D.C. 20013  
202-667-3300 fax: 202-667-7751

American Forests - Global Releaf  
Coordinator  
1516 P St., NW  
Washington, D.C. 20005

American Forest Foundation  
1250 Connecticut Ave., NW  
Suite 320  
Washington, D.C. 20036  
202-463-2462 fax: 202-463-2461

American Geographical Society  
156 Fifth Ave., Suite 600  
New York, NY 10010-7002  
212-242-0214 fax: 212-989-1583

American Meteorological Society  
45 Beason Street  
Boston, MA 02108  
617-227-2425 fax: 617-742-8718

American Nuclear Society  
555 N. Kensington Ave.  
LaGrange Park, IL 60525  
708-579-8265 fax: 708-352-0499

American Society for Environmental Education  
P.O. Box 800  
Hanover, NH 03755

Americans for Energy Independence  
1629 K St., NW, Suite 602  
Washington, D.C. 20006  
202-466-2105 fax: 202-466-2108

Americans for the Environment  
1400 16th St., NW, Box 24  
Washington, D.C. 20036  
202-797-6665 fax: 202-797-6646

American Nuclear Energy Council  
410 First St., NE  
Washington, D.C. 20003  
202-484-2670

American Rivers  
801 Pennsylvania Ave., SE, Suite 400  
Washington, D.C. 20003  
202-547-6900 fax: 202-543-6142

American Society for Environmental History  
Center for Tech. Studies  
New Jersey Institute of Technology  
Newark, NJ 07012  
201-596-3334

Americans for Nuclear Energy  
2525 Wilson Blvd.  
Arlington, VA 22201  
703-528-4430

Animal Protection Institute of America  
2831 Fruitridge Rd.  
Sacramento, CA 95822  
916-731-5521 fax: 916-731-4467

Animal Welfare Institute  
P.O. Box 3650  
Washington, D.C. 20007  
202-337-2332 fax: 202-338-9478

Association for Environmental and Outdoor  
Education  
Attention: Roger D. Morrow  
9616 Verhudson  
Gig Harbor, WA 98335

Biomass Energy Res. Association  
1825 K St., NW, Suite 503  
Washington, D.C. 20006  
1-800-247-1755

Center for Environmental Education, Inc.  
1725 Desales St., SW, Suite 500  
Washington, D.C. 20036

Environmental Action, Inc.  
1525 New Hampshire Ave. NW  
Washington, D.C. 20036

Environmental Education Coalition  
R.D.2 Box 1010  
Dingsman Ferry, PA 18328

Global Tomorrow Coalition  
1325 G St., NW, Suite 915  
Washington, D.C. 20005

Greenpeace USA, Inc.  
1436 U St., NW  
Washington, D.C. 20009

Institute for Earth Education, The  
Box 288  
Warrenville, IL 6055

International Ecology Society  
1471 Barclay St.  
St. Paul MN 55106-1405

Keep America Beautiful  
9 West Broad St.  
Stamford, VCT 06902

Living Lightly  
Schilitz Audubon Center  
1111 East Brown Deer Rd.  
Milwaukee, WI 53217-1999  
414-352-2880

National Association for Environmental Education  
P.O. Box 569031  
Miami, FL 33156

National Clearinghouse on Dev. and Envir. Edu.  
American Forum on Global Education  
45 John St., Suite 908  
New York, NY 10038

National Consortium for Envir. Edu. and Training  
School of Natural Resources and Environment  
University of Michigan  
430 East University Ave.  
Ann Arbor, MI 48109

National Wildlife Federation  
1400 16th St., NW  
Washington, D.C. 20036-2266

National Geographic Society  
17th and M St., NW  
Washington, D.C. 20036

Nature Conservancy, The  
1815 North Lynn St.  
Arlington, VA 22209

North American Assoc. for Environmental Education  
Box 400  
Troy, OH 45373  
(NAAEE Membership and Publications Office)

Oceanic Society, The  
Executive Offices  
1536 16th St., NW  
Washington, D.C. 20036

Office of Environmental Education  
U.S. EPA  
401 M St., SW (A-107)  
Washington, D.C. 20460

Population Institute, The  
110 Maryland Ave., NE  
Washington, D.C. 20002  
Project WILD  
Attention: Project WILD Director  
Western Region. Environmental Education Council  
4014 Chatham Lane  
Houston, TX 77027

Public Citizen  
2000 P St., NW  
Washington, D.C. 20036  
202-833-3000

Science, Mathematics, and Environmental Education  
Analysis Center  
Information Resource Center  
1200 Chambers Rd., Room. 310  
Columbus., OH 43212-1792

Wilderness Society, The  
1400 I St., NW 10th Floor  
Washington, D.C. 20005

Wildlife Conservation International  
New York Zoological society  
Bronx, NY 10460

Wildlife Society, The  
5410 Grosvenor Lane  
Bethesda, MD 20814

World Resources Institute  
1709 New York Ave., NW  
Washington, D.C. 20006

World-Wide Fund - Conservation Foundation  
1250 24th St., NW  
Washington, D.C. 20037

Worldwatch Institute  
1776 Massachusetts Ave., NW  
Washington, D.C. 20036

Zero Population Growth, Inc.  
1601 Connecticut Ave., NW  
Washington, D.C. 20009

# Directory

## POLLUTION PREVENTION

### Federal Government Organizations

Environmental Protection Agency  
401 M St., SW  
Washington, D.C. 20460  
202-260-2090

House Agriculture Committee  
U.S. House of Representatives  
Washington, D.C. 20515  
202-255-2171

House Energy and Commerce Committee  
U.S. House of Representatives  
Washington, D.C. 20515  
202-255-2927

Nuclear Regulatory Commission  
Washington, D.C. 20555  
301-415-7000

Senate Environment and Public Works Committee  
U.S. Senate  
Washington, D.C. 20515  
202-224-6176

Tennessee Valley authority  
400 W. Summit Hill Dr.  
Knoxville, TN 37902  
615-632-2101

United Coast Guard  
Department of Transportation  
2100 2nd St., SW  
Washington, D.C. 20593  
202-267-2229

United States Department of Energy  
Office of Civilian Radioactive Waste Management  
P.O. Box 44375  
Washington, D.C. 20026  
1-800-225-NWPA

United States Department of the Interior  
Interior Building, 1849 C St., NW  
Washington, D.C. 20240  
202-208-1100

United States Geological Survey  
12201 Sunrise Valley Dr  
Reston, VA 22092 7  
03-648-4000

### EPA Regional Offices

See Ecology Directory

### Alabama State Agencies/Organizations

Alabama Bottle and Can Coalition  
307 Shooting Star Trail  
Gurley, AL 35748  
205-776-4015

Alabama Department of Education  
50 N. Ripley  
Gordon Persons Building  
Montgomery, AL 36130  
334-242-9700 or 334-242-8154

Alabama Lung Association  
900 18th St., South  
Birmingham, AL 35020  
205-933-8821

Alabama PALS: People Against a Littered State  
46 Commerce St.  
Montgomery, AL 36104  
334-263-7737

Alabamians for a Clean Environment  
P.O. Box 1526  
Livingston, AL 35470  
205-652-9854

Center for Environmental Research and Service  
Attention: Information and Public Relations  
Coordinator  
Troy State University  
Troy, AL 36082  
334-566-4424 or 1-800-642-2377

## **Other Environmental Agencies/Organizations**

Acid Rain Foundation, Inc.  
1630 Blackhawk Hills  
St. Paul, MN 55122

Air and Waste Management Association  
P.O. Box 2861  
Pittsburgh, PA 15230  
412-232-3444 fax: 412-232-3450

Air Pollution Control Association  
P.O. Box 2861  
Pittsburgh, PA 15230

American Nuclear Energy Council  
410 First St., SE  
Washington, D.C. 20003  
202-484-2670

American Petroleum Institute  
1220 L St., NW  
Washington, D.C. 20005  
202-682-8000

American Rivers  
801 Pennsylvania Ave., SE, Suite 400  
Washington, D.C. 20003  
202-547-6900 fax: 202-543-6142

Amoco Teaching Aids  
P.O. Box 1400K  
Dayton, OH 45414

Asbestos Information Association of North America  
1745 Jefferson Davis Hwy., Suite 406  
Arlington, VA 22202  
703-412-1150 fax: 703-412-1152

Center for Environmental Information  
46 Prince st.  
Rochester, NY 14607-1016  
716-271-3550 fax: 716-271-0606

Center for Marine Conservation  
1725 DeSales St., NW, Suite 500  
Washington, D.C. 20036  
202-429-5609 fax: 202-872-0619

Chevron Chemical Company  
Educational Materials  
Public Affairs Department  
P.O. Box 3744  
San Francisco, CA 94119

Ciba-Geigy Corporation  
Attention: Corporation Relations Department  
Ardsley, NY 10502

Clean Air Working Group  
818 Connecticut Ave., NW  
Washington, D.C. 20006

Clean Water Action  
1320 18th St., NW, Suite 300  
Washington, D.C. 20036  
202-457-1286 fax: 202-457-0287

Clean Sites  
1199 N. Fairfax St.  
Alexandria, VA 22314  
703-683-8522

Dow Chemical U.S.A.  
Ag Products  
P.O. Box 1706  
Midland, MI 48640

Environmental Action  
6930 Carroll Ave., Suite 600  
Takoma Park, MD 20912  
301-891-1100 fax: 301-891-2218

Friends of the Sea Otter  
140 Franklin St., Suite 309  
Monterey, CA 93940  
408-373-2747

Georgia-Pacific Corporation  
Educational Services  
133 Peachtree St., NW  
Atlanta, GA 30303

Greenpeace, U.S.A.  
1436 U St., NW  
Washington, D.C. 20009  
202-462-1177 fax: 202-462-4507

Hazardous Materials Control Research Institute  
7237 Hanover parkway  
Greenbelt, MD 20770  
301-982-9500 fax: 301-220-3870

Household Hazardous Waste Project  
1031 E. Battlefield, Suite 214  
Springfield, MO 65807  
417-889-5000

Inform  
381 Park Ave. South  
New York, NY 10016  
212-689-4040 fax: 212-447-0689

ICI Americas, Inc.  
Ag Chem Division  
Attention: Lorraine Smith  
Wilmington, Delaware 19897

Institute for Environmental Education  
18554 Haskins Rd.  
Chagrin Falls, OH 44023-1823  
212-543-7303 fax: 216-543-7160

International Bird Rescue Research Center  
699 Potter St.  
Berkeley, CA 94710  
510-841-9086

Keep America Beautiful, Inc.  
99 Park Avenue  
New York, NY 10016

LaMotte Company  
P.O. Box 329  
Chestertown, MD 21620  
410-778-3100 fax: 410-778-6394

Manufacturers of Emission Controls Association  
1707 L St., NW  
Washington, D.C. 20036  
202-296-4797 fax: 202-331-1388

National Agricultural Chemicals Association  
1155 15th St., NW  
Madison Building Suite 900  
Washington, D.C. 22005  
202-296-1585

National Association of Noise Control Officials  
53 Cubberly Rd.  
Trenton, NJ 08690  
609-586-2684

National Coalition Against the Misuse of Pesticides  
701 E St., SE, Suite 200  
Washington, D.C. 20003  
202-543-5450

National Geographic Society  
17th and M St., NW  
Washington, D.C. 20036

Nuclear Information and Resource Service  
1424 16th St., NW, Suite 601  
Washington, D.C. 20036  
202-328-0002 fax: 202-462-2183

Smithsonian Institution  
Office of Environmental Awareness  
S. Dillon Ripley Center., Suite 3123  
Washington, D.C. 20560  
202-357-4797 fax 202-786-2557

Southwest Research and Igrass Roots Information  
Center.  
P.O. Box 4524  
Albuquerque, NM 87106  
505-262-1862

Toxicant Program/HHWD Project  
METRO M/S 81  
821 2nd Ave.  
Seattle, WA 98104

Water Environment Federation  
601 Wythe St.  
Alexandria, VA 22314-1994  
1-800-666-0206 fax: 703-684-2492

# Directory

## WASTE MANAGEMENT

### Federal Government Organizations

Federal Highway administration  
400 7th St., SW  
Washington, D.C. 20590  
202-366-0600

House Energy and Commerce Committee  
U.S. House of Representatives  
Washington, D.C. 20515  
202-255-2927

United States Department of Energy  
Office of Civilian Radioactive Waste Management  
P.O. Box 44375  
Washington, D.C. 20026  
1-800-225-NWPA

### EPA Regional Offices

See Ecology Directory

### Alabama State Agencies/Organizations

Alabama Bottle and Can Coalition  
307 Shooting Star Trail  
Gurley, AL 35748  
205-776-4015

Alabama Department of Education  
50 N. Ripley  
Gordon Persons Building  
Montgomery, AL 36130  
334-242-9700 or 334-242-8154

Alabama PALS: People Against a Littered State  
46 Commerce St.  
Montgomery, AL 36104  
334-263-7737

Environmental Education Association of Alabama  
Troy State University  
Box 596  
Troy, AL 36082

### Other Environmental Agencies/Organizations

Aluminum Association, Inc., The  
Attention: Manager of Educational Services  
818 Connecticut Ave., NW  
Washington, D.C. 20006

American Nuclear Energy Council  
410 First St., NE  
Washington, D.C. 20003  
202-484-2670

American Nuclear Society  
555 N. Kensington Ave.  
LaGrange Park, IL 60525  
708-579-8265 fax: 708-352-0499

American Plastics Council  
1730 D St., NW  
Washington, D.C. 20006  
202-737-8300

Americans for Nuclear Energy  
2525 Wilson Blvd.  
Arlington, VA 22201  
703-528-4430

Association of Foam Packaging Recyclers  
1025 Connecticut Ave., NW, Suite 515  
Washington, D.C. 20036  
202-822-6424 fax: 202-331-0538

A-Way With Waste  
Washington State Department of Ecology  
4350 150th Ave., NE  
Redmond, WA 98052

Center for Environmental Information  
46 Prince St.  
Rochester, NY 14607-1016  
716-271-3550 fax: 716-271-0606

Center for Renewable Resources  
Publications Department  
641 S. Pickett St.  
Alexandria, VA 22304

Department of Environmental Management  
Hazardous Waste Branch, Land Division  
1751 Cong. W.L. Dickinson Dr.  
Montgomery, Alabama 36130  
334-271-7700

Dow Chemical U.S.A.  
Ag Products  
P.O. Box 1706  
Midland, MI 48640

Hazardous Materials Control Research Institute  
7237 Hanover parkway  
Greenbelt, MD 20770  
301-982-9500 fax: 301-220-3870

Hazardous Waste Management and Resource  
Recovery Program  
University of Alabama  
HAMMARR  
P.O. Box 1968  
University, AL 35486

Household Hazardous Waste Project  
1031 E. Battlefield, Suite 214  
Springfield, MO 65807  
417-889-5000

Inform  
381 Park Ave. South  
New York, NY 10016  
212-689-4040 fax: 212-447-0689

National Clearinghouse on Dev. and Envir. Edu.  
American Forum on Global Education  
45 John St., Suite 908  
New York, NY 10038

National Geographic Society  
17th and M St., NW  
Washington, D.C. 20036

National Solid Wastes Management Association  
1730 Rhode Island Ave., NW, Suite 1000  
Washington, D.C. 20036  
202-659-0708 fax: 202-775-5917

Nuclear Information and Resource Service  
1424 16th St., NW, Suite 601  
Washington, D.C. 20036  
202-328-0002 fax: 202-462-2183

Polystyrene Packaging Council, Inc.  
1025 Connecticut Ave., NW, Suite 515  
Washington, D.C. 20036  
202-822-6424 fax: 202-331-0538

Reynolds Aluminum Recycling Company  
Attention: Public Relations Manager  
P.O. Box 27003  
Richmond, VA 23261

Smithsonian Institution  
Office of Environmental Awareness  
S. Dillon Ripley Center., Suite 3123  
Washington, D.C. 20560  
202-357-4797 fax 202-786-2557

Southwest Research and Igrass Roots Information  
Center.  
P.O. Box 4524  
Albuquerque, NM 87106  
505-262-1862

Steel Recycling Institute  
680 Andersen Dr.  
Pittsburgh, PA 15220  
1-800-876-SCRI or 412-922-2772 fax: 412-922-3213

Toxicants in Consumer Products  
METRO Exchange Building  
821 2nd Ave.  
Seattle, WA 98104  
206-447-5875

Washington Citizens for Recycling  
157 Yesler Way  
Seattle, WA 98104  
206-343-5171 fax: 206-624-2110

# Directory

## NATURAL RESOURCES

### **Federal Government Organizations**

Army Corps of Engineers  
Department of Defense  
20 Massachusetts Ave., NW  
Washington, D.C.  
202-272-0010

Bureau of Land Management (U.S.)  
Main Interior Building  
18th and C St., NW  
Washington, D.C. 20240  
202-343-5717

Bureau of Land Management  
Department of the Interior (U.S.)  
Anasazi Heritage Center  
27501 Hwy. 184, P.O. Box 758  
Dolores, CO 81323  
303-882-4811 fax: 303-882-7595

Bureau of Mines (U.S.)  
Motion Pictures  
Cockrans Mill Road  
P.O. Box 18070  
Pittsburgh, PA 15236  
412-675-4338

Bureau of Reclamation (U.S.)  
Main Interior Building  
18th and C St., NW  
Washington, D.C. 20240  
202-343-4662

Coast Guard (U.S.)  
Department of Transport  
2100 2nd St., SW  
Washington, D.C. 20593  
202-267-2229

Department of Agriculture  
12th and 14th St., NW  
Washington, D.C. 20250  
202-477-8732

Department of Defense  
The Pentagon  
Office of the Secretary  
Washington, D.C. 20301-8000

Department of Justice  
Environment and Natural Resources Division  
10th St. and Constitution Ave., Room 2143  
Washington, D.C. 20530  
202-514-2701

Department of the Air Force  
Washington, D.C. 20330

Department of the Interior  
Interior Building  
1849 C St., NW  
Washington, D.C. 20240  
202-208-1100

### **EPA Regional Offices**

See Ecology Directory

Federal Hwy. Administration  
400 7th St., NW  
Washington, D.C. 20590  
202-366-0600

Fish and Wildlife Service (U.S.)  
Department of the Interior  
Main Interior Building  
Washington, D.C. 20240  
202-343-5634

Forest Service (U.S.)  
P.O. Box 96090  
Washington, D.C. 20090  
202-447-3957

Geological Survey (U.S.)  
12201 Sunrise Valley Dr.  
Reston, VA 22092  
703-648-4000

House Committee on Interior and Insular Affairs  
U.S. House of Representatives  
Washington, D.C. 20515  
202-255-2761

House Energy and Commerce Committee  
U.S. House of Representatives  
Washington, D.C. 20515  
202-255-2927

House Merchant Marine and Fisheries Committee  
U.S. House of Representatives  
Washington, D.C. 20515  
202-255-4047

Minerals Information Office Bureau of Mines (U.S.)  
Department of Interior Building  
19th and C St., NW MS 2647-MIB  
Washington, D.C. 20240

National Marine Fisheries Service  
Department of Commerce (U.S.)  
1335 East-West Hwy.  
Silver Springs, MD 20910  
301-427-2370

National Oceanic and Atmospheric Administration  
14th St. and Constitution Ave., NW  
Washington, D.C. 20230  
202-343-4747

National Park Service  
Main Interior Building  
Washington, D.C. 20240  
202-343-4747

Office of Conservation and Renewable Energy  
1000 Independence Ave., SW  
Washington, D.C. 20585  
202-586-9220

Office of Surface Mining  
1951 Constitution Ave., NW  
Washington, D.C. 20240  
202-343-4953

Senate Agriculture, Nutrition and Forestry  
Committee  
U.S. Senate  
Washington, D.C. 20515  
202-224-2035

Senate Commerce, Science and Transportation  
Committee  
U.S. Senate  
Washington, D.C. 20515  
202-224-5115

Senate Energy and Natural Resources Committee  
U.S. Senate  
Washington, D.C. 20515  
202-224-4917

Soil Conservation Service  
Department of Agriculture (U.S.)  
14th St. and Independence Ave., SW  
P.O. Box 2890  
Washington, D.C. 20013  
202-447-4543

U.S. Army Construction Engineering Research Lab  
P.O. Box 9005  
Champaign, IL 61826-9005  
217-352-6511

#### **Alabama State Agencies/Organizations**

Agriculture and Industries  
Attention: Information Director  
P.O. Box 3336  
Montgomery, AL 36109  
334-242-5872

Alabama Audubon Council  
2616 Mountain Brook Parkway  
Birmingham, AL 35223  
205-879-1935

Alabama BASS Chapter Federation  
3717 Sola Cr.  
Fort Payne, AL 35967  
205-845-1441

Alabama Conservancy, The  
2717 7th Ave., S. Suite 207  
Birmingham, AL 35233

Alabama Cooperative Extension Service  
109 Duncan Hall, Auburn Hall  
Auburn University, AL 36849-5612  
205-844-4444 fax: 205-844-5544  
E-mail: athompso@acenet.auburn.edu  
Alabama Cooperative Fish and Wildlife Research

Unit  
331 Funchess Hall,  
Auburn University  
Auburn, AL 36849  
205-844-4796

Alabama Department of Education  
50 N. Ripley  
Gordon Persons Building  
Montgomery, AL 36130  
334-242-9700 or 334-242-8154

Alabama Energy Extension Services  
Box 6282  
University, AL 35486  
1-800-452-5901

Alabama Forest Owner's Association  
P.O. Box 104  
Helena, AL 35080  
205-987-8811

Alabama Forestry Association  
555 Alabama St.  
Montgomery, AL 36104  
334-265-8733

Alabama Forestry Commission  
513 Madison Ave.  
Montgomery, AL 36130  
334-240-9300

Alabama Natural Heritage Section  
State Lands Division  
Department of Conservation and Natural Resources  
64 Union St.  
Montgomery, AL 36130  
334-242-3484

Alabama Surface Mining Commission  
P.O. Box 2390  
Jasper, AL 35502  
205-221-4130

Alabama Waterfowl Association  
Rt. 2, Box 179  
Scottsboro, AL 35768  
205-259-2509

Alabama Wilderness Alliance  
P.O. Box 223  
Moulton, AL 35650  
205-974-7678

Alabama Wildflower Society  
3914 S. River Circle  
Birmingham, AL 35243  
205-967-0304

Alabama Wildlife Federation  
46 Commerce St.  
Montgomery, AL 36104  
334-832-9453

Alabama Wildlife Society  
Auburn University, Department of Zoology  
331 Funchess Hall  
Auburn, AL 36849-5414  
205-844-4850 or 205-844-9247

Alabama Zoological Society  
2630 Cahaba Road  
Birmingham, AL 35223

Audubon Society  
Birmingham Chapter  
749 eastern Manor Lane  
Birmingham, AL 35215  
205-849-9202

Bankhead Watershed Project, The  
P.O. Box 117  
Moulton, AL 35650  
205-974-7678

Bass Anglers Sportsman Society  
5845 Carmichael Rd.  
Montgomery, AL 36117  
334-272-9530

Cahaba River Society  
2717 7th Ave., S., Suite 207  
Birmingham, AL 35223

Department of Agriculture and Industries  
P.O. Box 3336  
Montgomery, AL 36193  
334-261-2650

Department of Conservation and Natural Resources  
64 Union St.  
Montgomery, AL 36130  
334-242-3486

Department of Environmental Management  
P.O. Box 301463  
Montgomery, AL 36130-1463

Ducks Unlimited  
7706 Shadow Bend Dr., SE  
Huntsville, AL 35802  
205-881-6895

Ducks Unlimited  
3413 Old Woods Lane  
Birmingham, AL 35243  
205-322-8636

Ducks Unlimited  
305 4th St., #408  
Decatur, AL 35601  
205-350-5557

Environmental Education Association of Alabama  
Troy State University  
Box 596  
Troy, AL 36082

Forestry Commission  
513 Madison Ave.  
Montgomery, AL 36130  
334-240-9304

Geological Survey of Alabama  
State Oil and Gas Board  
P.O. Box 0  
Tuscaloosa, AL 35486-9780  
205-349-2852

Gulf Coast Conservation Association  
P.O. Box 16897  
Mobile, AL 36606  
334-478-3474

Johnson Research Center/Alabama Solar Energy  
Center  
University of Alabama In Huntsville  
Research Institute, Annex D  
Huntsville, AL 35899  
1-800-228-5897

Marine Environmental Sciences Consortium  
P.O. Box 369-370  
Dauphin Island, AL 36528  
334-861-2141

Montgomery Zoo  
P.O. Box ZEBRA  
Montgomery, AL 36109-0313  
334-240-4900

National Forests in Alabama  
USDA Forest Service  
2946 Chestnut St.  
Montgomery, AL 36107  
334-832-4470

Nature Conservancy of Alabama, The  
2821 C 2nd Ave., S.  
Birmingham, AL 35233  
205-251-1155 fax: 205-252-4444

Sea Grant program  
Gulf Coast Research Laboratory  
P.O. Box 7000  
Ocean Springs, MS 39566-7000  
601-875-9341 fax: 601-875-0528

Shoals Audubon Society  
1612 Sheffield Dr.  
Sheffield, AL 35660  
205-383-6338

Soil Conservation Service  
P.O. Box 311  
Auburn, AL 36830  
205-887-4523

The Bankhead Monitor  
(A publication about the Bankhead National Forest)  
P.O. Box 117  
Moulton, AL 35650

The Talladega Monitor  
(A publication about the Talladega National Forest)  
P.O. Box 117  
Moulton, AL 35650

U.S. Forest Service  
1765 Highland Ave.  
Montgomery, AL 36107  
334-832-7630

U.S. Fish and Wildlife Service  
P.O. Drawer 1197  
Daphne, AL 36526  
334-690-2181

Water Resource Research Institute  
Hargis Hall, Room 202  
Auburn University, AL 36849  
205-826-5075

Wheeler National Wildlife Refuge  
T. 4, Box 250  
Decatur, AL 35603  
205-353-7243

Wildlife Action of Alabama  
P.O. Box 949  
Point Clear, AL 36564-0949  
334-479-1098

Wildlife Rescue Service  
2107 Marlboro Ave.  
Birmingham, AL 35226  
205-663-7930  
Hotline: 205-320-6189

Wildlife Sanctuary  
9344 County Road 59  
Troy, AL 36081  
334-735-2950

Wildlife Society, Alabama Chapter  
Route 7, Box 131  
Andalusia, Alabama 36420  
334-222-7779

### **Other Agencies/Organizations**

Alliance to Save Energy  
1725 K St., NW, Suite 509  
Washington, D.C. 20006  
202-857-0666 fax: 202-331-9588

Alternative Energy Resource Organization  
25 S. Ewing, Room 214  
Helena, MT 59601  
406-443-7272 fax: 416-442-9120

American Association of Zoological Parks and  
Aquariums  
Oglebay Park  
Wheeling, WV 26003  
304-242-2160

American Cave Conservation Association  
American cave and Karst Center  
P.O. Box 409  
Horse Cave, KY 42749  
502-786-1466 fax: 502-786-1466

American Cetacean Society  
P.O. Box 2639  
San Pedro, CA 90731  
310-548-6279 fax: 310-548-6950

American Coal Foundation  
918 16th St., NW, Suite 404  
Washington, D.C. 20006-2902

American Council for an Energy Efficient Economy  
1001 Connecticut Ave., NW, Suite 801  
Washington, D.C. 20036  
202-429-8873 fax: 202-429-2248

American Fisheries Society  
5410 Grosvenor Lane, Suite 110  
Bethesda, MD 20814-2199  
301-897-8616 fax: 301-897-8096

American Forest Foundation  
1250 Connecticut Ave., NW, Suite 320  
Washington, D.C. 20036  
202-463-2462 fax: 202-463-2461

American Forests - Global Releaf program  
P.O. Box 2000  
Washington, D.C. 20013  
202-667-3300 fax: 202-667-7751

American Gas Association  
1515 Wilson Boulevard  
Arlington, VA 22209

American Geographical Society  
156 5th Ave., Suite 600  
New York, NY 10010-7002  
212-242-0214 fax: 212-989-1583

American Geological Institute  
5220 King St.  
Alexandria, VA 22303  
703-379-2480 fax: 703-379-7563

American Humane Association  
63 Inverness Dr., E.  
Englewood, CO 80112  
303-792-9900 fax: 303-792-5333

American Institute of Professional Geologists  
7828 Vance Dr., Suite 103  
Arvada, CO 80003  
303-431-0831

American Iron and Steel Institute  
attention: Education Cooperation Services  
1000 16th St., NW  
Washington, D.C. 20036

American Mining Congress  
1920 N St., NW, Suite 300  
Washington, D.C. 20036-1662  
202-861-2800 fax: 202-861-2846

American Nature Study Society  
5881 Cold Brook Rd.  
Homer, NY 13077  
604-749-3655

American Petroleum Institute  
1220 L St., NW  
Washington, D.C. 20005  
202-682-8000

American Rivers  
801 Pennsylvania Ave., SE, Suite 400  
Washington, D.C. 20003  
202-547-6900 fax: 202-543-6142

American Society for Environmental History  
Center for Technology Studies  
New Jersey Institute of Technology  
Newark, NJ 07012  
201-596-3334

American Society of Agricultural Engineers  
2950 Miles Rd.  
St. Joseph, MI 49085  
616-429-0300 fax: 616-429-3852

American Society of Agronomy  
Crop Science Society of America  
Soil Science Society of America  
677 South Segoe Rd.  
Madison, WI 53711  
608-273-8080 fax: 608-273-2021

American Society of Mammalogists  
Bell Museum of Natural History  
University of Minnesota  
Minneapolis, MN 55455

Americans for Energy Independence  
1629 K St., NW, Suite 602  
Washington, D.C. 20006  
202-466-2105 fax: 202-466-2108

Amoco Teaching Aids  
P.O. Box 1400K  
Dayton, OH 45414

Animal Protection Institute of America  
2831 Fruitridge Rd.  
Sacramento, CA 95822  
916-731-5521 fax: 916-731-4467

Animal Welfare Institute  
P.O. Box 3650  
Washington, D.C. 20007

Appalachian Mountain Club  
5 Joy St.  
Boston, MA 02108  
617-523-0636

Biomass Energy Research Association  
1825 K St., NW, Suite 503  
Washington, D.C. 20006  
1-800-247-1755

Caretta Research Project  
Savannah Science Museum  
4405 Paulsen St.  
Savannah, GA 31405  
912-355-6705 fax: 912-355-0182

Center for Environmental Information  
46 Prince St.  
Rochester, NY 14607-1016  
716-271-2550 fax: 716-271-0606

Center for Holistic Resource Management  
5820 Fourth St., NW  
Albuquerque, NM 87107  
505-344-3445 fax: 505-344-9079

Center for Marine Conservation  
1725 Desales St., NW, Suite 500  
Washington, D.C. 20036

Children's Rainforest, The  
P.O. Box 936  
Lewiston, ME 04240

Climate Protection Institute  
5833 Balmoral Cr.  
Oakland, CA 94619  
510-531-0100

Conservation International  
1015 18th St., NW, Suite 1000  
Washington D.C. 20036  
202-429-5660 fax: 202-887-5188

Defenders of Wildlife  
1244 19th St., NW  
Washington, D.C. 20036  
202-659-9510 fax: 202-833-3349

Delta Waterfowl Foundation  
102 Wilmot Rd., Suite 410  
Deerfield, IL 60015  
708-940-7776

Earthtrust  
25 Kaneohe Bay Dr., Suite 205  
Kailua, HI 96734  
808-254-2866 fax: 808-254-6409

EARTH WATCH  
Office of Public Affairs  
P.O. Box 403N  
Watertown, MA 02272  
617-926-8200 fax: 617-926-8532

Energy Research Institute  
6850 Rattlesnake Hammock Rd.  
Naples, FL 33962  
813-793-1922 fax: 813-793-1260

Environmental Action  
6930 Carroll Ave., Suite 600  
Takoma Park, MD 20912  
301-891-1100 fax: 301-891-2218

Environmental Education project  
19600 S. Molalla Ave.  
Oregon City, OR 97045

Environmental Media Corporation  
P.O. Box 1016  
Chapel Hill, NC 27514  
919-933-3003 fax: 919-942-8785

Florida Solar Energy Center  
300 State Road 401  
Cape Canaveral, FL 32920

Friends of the Sea otter  
140 Franklin st., Suite 309  
Monterey, CA 93940  
408-373-2747

Fund for Animals, The  
200 W. 57th St.  
New York, NY 10019  
212-246-2096 fax: 212-246-2633

Georgia-Pacific Corporation  
Educational Services  
133 Peachtree St., NW  
Atlanta, GA 30303

Hawk-Watch International, Inc.  
P.O. Box 35706  
Albuquerque, NM 87176-5706  
505-255-7622 fax: 505-255-1755

Inform  
381 Park Ave., South  
New York, NY 10016  
212-689-4040 fax: 212-447-0689

Institute for Environmental Education  
18554 Haskins Rd.  
Chagrin Falls, OH 44023-1823  
212-543-7303 fax: 246-543-7160

Marine Technology Society  
2000 Florida Ave., NW, Suite 500  
Washington, D.C. 20009

Mississippi-Alabama Sea Grant Consortium  
Caylor Building  
Gulf Coast Research laboratory  
Ocean Springs, MS 39564

Missouri Botanical Garden  
P.O. Box 299  
St. Louis, MO 63166

National Audubon Society  
801 Pennsylvania Ave., SE  
Washington, D.C. 20003

National Clearinghouse on Dev. and Env. Education  
American Forum on Global Education  
45 John St., Suite 908  
New York, NY 10038

National Council for Geographic Education  
16A Leonard Hall  
Indiana University of Pennsylvania  
Indiana, PA 15705

National Consortium for Environmental Education  
and Training  
School of Natural resources and Environment  
University of Michigan  
430 East University Ave.  
Ann Arbor, MI 48109

National Energy Foundation  
5160 Wiley Post Way, Suite 200  
Salt Lake City, UT 84116  
801-539-1406

National Food and Energy Council  
409 Van Diver W., Suite 202  
Columbia, MO 65202  
314-875-7155

National Geographic Society  
17th and M St., NW  
Washington, D.C. 20036

National Parks and Conservation Association  
1015 31st St., NW  
Washington, D.C. 20007  
202-223-6722

National Wildflower Research Center  
2600 FM 973  
North Austin, TX 78725

National Wildlife Federation  
1400 16th St., NW  
Washington, D.C. 20036-2266

National Wildlife Refuge Association  
10824 Fox Hunt Lane  
Potomac, MD 20854  
301-983-1238

National Zoological Park  
Smithsonian Institute  
Washington, D.C. 20008

Natural Resources Defense Council, Inc.  
40 West 20th St.  
New York, NY 10011

North American Bluebird Society  
P.O. Box 6295  
Silver Spring, MD 20906

Oceanic Society, The  
Executive Offices  
1536 16th St., NW  
Washington, D.C. 20036

Rainforest Action Network  
450 Sansome, Suite 700  
San Francisco, CA 94111

Resources for the Future  
1616 P St., NW  
Washington, D.C. 20036

Smithsonian Institution  
Office of Environmental awareness  
S. Dillon Ripley Center, Suite 3123  
Washington, D.C. 20560  
202-357-4797 fax: 202-786-2557

Soil Conservation Society of America  
7515 N.E. Ankeny Rd.  
Ankeny, Iowa 50021-9764

Southwest Research and Igrass Roots Information  
Center  
P.O. Box 4524  
Albuquerque, NM 87106  
505-262-1862

Student Conservation Association  
P.O. Box 550  
Charlestown, NH 03603  
603-543-1700 fax: 603-543-1828

Tennessee Valley Authority  
Division of Land and Economic Resources  
1A16 Old City Hall Complex  
Knoxville, TN 37902  
615-632-6449

Trout Unlimited  
501 Church St., NE  
Vienna, VA 22180  
703-281-1100

Union of Concerned Students  
26 Church st.  
Cambridge, MA 02238  
617-547-5552 fax: 617-864-9405

Wildlife Conservation International  
New York Zoological Society  
185th St. and Southern Blvd.  
Bronx, NY 10460-1099  
718-220-5141

World Resources Institute  
1709 New York Ave, NW  
Washington, D.C. 20006  
410-516-6963

World Society for the Protection of Animals  
P.O. Box 190  
Boston, MA 02130  
617-522-7000 fax: 617-522-7077

World Wildlife Fund/Conservation Foundation  
1250 24th St., NW  
Washington, D.C. 20037

# Directory

## OTHER ENVIRONMENTAL SOURCES

### Federal Government Agencies/Organizations

Army Corps of Engineers  
Department of Defense  
20 Massachusetts Ave., NW  
Washington, D.C. 20314  
202-272-0010

### EPA Regional Offices

See Ecology Directory

House Appropriations Committee  
U.S. House of Representatives  
Washington, D.C. 20515  
202-255-2771

House Interior Committee  
U.S. House of Representatives  
Washington, D.C. 20515  
202-255-2761

House Merchant Marine and Fisheries Committee  
U.S. House of Representatives  
Washington, D.C. 20515  
202-255-4047

House Public Works and Transportation Committee  
U.S. House of Representatives.  
Washington, D.C. 20515  
202-255-4472

National Institute for Occupational Safety and Health  
U.S. Department of Labor  
200 Constitution Ave., NW  
Washington, D.C. 20240  
202-343-4953

Senate Commerce, Science and Transportation  
Committee  
U.S. Senate  
Washington, D.C. 20515  
202-224-5115

### State Agencies Organizations

Alabama Cooperative Extension Service  
State Headquarters  
Auburn University, AL 36849  
205-826-4444

Alabama Farmers Federation P.O. Box 11000  
Montgomery, AL 36191-0001  
334-288-3900

Alabama Handicapped Sportsmen  
44 Huntington Place  
Northport, AL 35476  
205-339-2800

Alabama Hiking Association  
P.O. Box 4311  
Birmingham, AL 35206

Alabama Solar Association  
Route 3, Box 160  
Decatur, AL 35603

Alabama State Museum of Natural History  
University of AL, Department of Archeology  
13075 Moundville Archaeological Park  
Moundville, AL 35474  
205-371-2266

Bureau of Tourism and Travel  
401 Adams Ave., Suite 126  
Montgomery, AL 36104

Dothan Landmarks Foundation, Inc.  
P.O. Box 6362  
Dothan, AL 36302  
334-794-3452

Exploreum Museum of Discovery  
1906 Springhill  
Mobile, AL 36607  
334-476-6873

Friends of Little River  
P.O. Box 111  
Mentone, AL 35984  
205-634-4510 or 205-634-4066

Ruffner Mountain Nature Center  
1214 South 81st St.  
Birmingham, AL 35206  
205-833-8264

Sierra Club, Alabama Chapter  
22 Hilltop Estates  
Northport, AL 35476  
205-339-4692 or 205-348-6695

Sierra Club, Alabama Chapter  
Montgomery Group  
P.O. Box 70031  
Montgomery, AL 36107

Vulcan Trail Association  
Attention: Office Central  
P.O. Box 19116  
Birmingham, AL 35219-9116  
205-933-4170

#### **Other Environmental Agencies/Organizations**

American Association for the Advancement of  
Science  
133 H St., NW  
Washington, D.C. 20005  
202-326-6640 fax 202-371-9526

American Camping Society  
Bradford Woods  
5000 State Road 67, North  
Martinsville, IN 46151-7902

American Chemical Society  
1155 16th St., NW  
Washington, D.C. 20036  
202-872-4600 fax: 202-833-7732

American Litteral Society  
Highlands, NJ 07732  
908-291-0055 fax: 908-872-8041

American Nature Study Society  
5881 Cold Brook Road  
Homer, NY 13077  
607-749-3655

American Red Cross  
1730 D St., NW  
Washington, D.C. 20006  
202-737-8300

American Society of Agricultural Engineers  
2950 Niles Road  
St. Joseph, MI 49085  
616-429-0300 fax: 616-429-3852

American Society of Civil Engineers  
345 East 47th St.  
New York, NY 10017  
1-800-548-2723 fax: 212-705-7300

Anheuser-Busch Companies, Inc.  
Department of Consumer Awareness and Education  
One Busch Place  
St. Louis, MO 63118  
Call your local distributor

Asbestos Information Association/North America  
1745 Jefferson Davis Hwy., Suite 406  
Arlington, VA 22202  
703-412-1150 fax: 703-412-1152

Association for Experimental Education  
P.O. Box 4625  
Denver, CO 80204

Association of Interpretive Naturalists, Inc.  
Central Business Office  
6700 Needwood Rd.  
Derwood, MD 20855

Bureau of Outdoor Recreation  
DEpartment of Interior  
18th an C St., NW  
Washington, D.C. 20240

Center for Emergency response Planning  
Workplace Health Fund  
815 16th St., NW, Suite 301  
Washington, D.C. 20006  
202-842-7833 fax 202-393-0623

Center for Safety in the Arts  
5 Beekman St.  
New York, NY 10038  
212-227-6220

Citizens for a United Earth  
1880 Route 64  
Ionia, NY 14475  
716-624-3673

Coalition for Education in the Outdoors  
Box 2000, SUNY College at Cortland  
Cortland, NY 13045  
607-753-4971

Council on Economic Priorities  
30 Irving Place  
New York, NY 10003-2386  
212-420-1133 fax: 212-420-0988

Council on Outdoor Education  
1900 Association Dr.  
Reston, VA 22091

Cousteau Society, Inc., The  
870 Greebrier Cr., Suite 402  
Chesapeake, VA 23320-2641  
804-523-9335 fax: 804-523-2747

Development Education Program  
Office of the Publisher  
The World Bank  
1818 H St., NW, #T8082  
Washington, D.C. 20433

Earth Island Institute  
300 Broadway, Suite 28  
San Francisco, CA 94133  
415-788-3666 fax: 415-788-7324

Edison Electric Institute  
Education Service Department  
701 Pennsylvania Ave., NW  
Washington, D.C. 20004

Epcot Teachers Center  
Walt Disney World  
P.O. Box 10000  
Lake Buena Vista, FL 32830

Friends of the Earth Foundation, Inc.  
1045 Sansome St.  
San Francisco, CA 94111

Humane Society of the United States  
2100 L St., NW  
Washington, D.C. 20037  
202-452-1100 fax: 202-778-6132

International Council for Outdoor Education  
P.O. Box 17255  
Pittsburgh, PA 15235

Izaak Walton League of America, Inc., The  
P.O. Box 824  
Iowa City, IA 52244

League of Conservation Voters  
1707 L St., NW, Suite 550  
Washington, D.C. 20036  
202-785-8683 fax: 202-835-0491

Monitor  
1506 19th St., NW  
Washington, D.C. 20036

National Association of Biology Teachers  
11250 Roger Bacon Dr., #19  
Reston, VA 22090

National Council for Social Studies  
3501 Newark St, NW  
Washington, D.C. 20016

National Education Association  
1201 16th St, NW  
Washington, D.C. 20036

National Science for Youth Foundation  
130 Azalea Dr.  
Roswell, GA 30075

National Science Teachers Association  
1742 Connecticut Ave., NW  
Washington, D.C. 20009

Outdoor Biology Instructional Strategies  
Lawrence Hall of Science  
University of California  
Berkeley, CA 93305

Planetary Society, The  
65 North Catalina Ave.  
Pasadena, CA 91106  
818-793-5100

Project ROSE  
University of Alabama  
Box G  
Tuscaloosa, AL 35487  
1-800-452-5501 or 205-349-4878

Rails-to-Trails Conservancy  
1400 16th St., NW, Suite 300  
Washington, D.C. 20036  
202-797-5400 fax: 202-797-5411

Safari Club International  
4800 West Gates Pass Rd.  
Tucson, AZ 85745

Seventh Generation  
Catalog Requests Department  
Colchester, VT 05446-1672  
1-800-456-1177

Thames Science Center  
Gallows Lane  
New London, CT 06320  
401-849-5952

Union of Concerned Students  
26 Church St.  
Cambridge, MA 02238

World Food Day  
1001 22nd St., NW, Suite 300  
Washington, D.C. 20437

World Game Institute  
University City Science Center  
3508 Market St.  
Philadelphia, PA 19104  
215-387-0220

Worldwise Schools  
United States Peace Corps  
1990 K St., NW  
Washington, D.C. 20526

# Discovering Alabama Program Guide

*Discovering Alabama*, a public television series, highlights the natural features and environmental issues of the state. Host Dr. Doug Phillips explores natural features on location by means of backcountry hiking and canoeing. Produced for general audiences, *Discovering Alabama* is also designed as an interdisciplinary teaching. Teachers' Guides have been published for several of the videos, and others are being developed. The series is a production of the Alabama Museum of Natural History in cooperation with Alabama Public Television.

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## Mobile-Tensaw Delta

Just south of Mobile Bay lies Alabama's Mobile-Tensaw Delta, named for the juncture of the Mobile and Tensaw Rivers. Among U.S. river deltas, the Mobile-Tensaw is second in size to the Mississippi River Delta. It, like other major river deltas of the world, has served as a natural attraction to early adventurers and as a globally significant wetland. Host Dr. Doug Phillips canoes the delta to examine its historical role in the exploration and settlement of the New World and its present status as a remarkable natural resource increasingly subject to competing human uses.

## Cheaha Mountain/Talladega National Forest

The Talladega Division of the Talladega National Forest contains the southernmost reaches of the Appalachian mountain chain, which extends approximately eighty miles into northeast Alabama and includes the state's highest peak, Cheaha Mountain, elevation 2,420 feet. Host Dr. Doug Phillips hikes several miles along the Chinnabee Silent Trail, a footpath constructed in the Talladega National Forest by scout troops from the Talladega School for the Deaf. Along the way, Phillips describes local history and explores many of the natural features of the area. He is joined by a group of elementary school students who climb Cheaha Mountain with him and discover the value of learning in the wondrous classroom of the outdoors.

## Cahaba River

Host Dr. Doug Phillips canoes a segment of the Cahaba River in northern Bibb County where the Cahaba lily grows, describing many natural features of the river and stopping for a close-up look at the rare lily. Joined by a fisheries biologist from the Alabama Department of Conservation and Natural Resources, Dr. Phillips discusses a number of concerns about environmental changes along the river. This program is the first of two *Discovering Alabama* programs featuring the Cahaba River. A second program, entitled the **Cahaba River Watershed**, explores the full length of the Cahaba and examines changes affecting the entire watershed.

## Southeast Alabama/Wiregrass Region

Because southeast Alabama lacks prominent features like the mountains of north Alabama or the beaches of coastal Alabama, it is a region that is sometimes overlooked by those seeking such natural attractions. However, in this program, Dr. Doug Phillips reveals that the southeast part of the state is quite rich in natural qualities with their own special wonder. Phillips travels across several southeast Alabama counties exploring a variety of unique features from the historically and biologically significant wiregrass region to the caves and sinkholes of adjoining limestone areas and visits the Conecuh National Forest.

## **Oakmulgee Division/Talladega National Forest**

Host Dr. Doug Phillips sets out from his own tract of Tuscaloosa County farm and forestland into the adjoining Oakmulgee Division of the Talladega National Forest. With camera crew in tow, Phillips invites viewers on a casual interpretive walk across the Oakmulgee to the National Forest Recreation Area, Payne Lake. Along the way, he examines a variety of plants and animals that live in the Oakmulgee and discusses the importance of maintaining such forestlands.

### **Lake Guntersville State Park**

Few places can match Alabama's Lake Guntersville State Park for its combination of mountainous natural setting and full scale accommodations for recreation. Dr. Doug Phillips explores both of these and other facets of the park's popular appeal, giving particular emphasis to the potential of the area's natural surroundings for helping to recover the endangered bald eagle, America's national symbol. Included is a visit with the park naturalist, who leads a group of children on an interpretive nature walk and discusses the importance of environmental education for America's youth.

### **Coastal Alabama-Natural Diversity**

Alabama's coastal area, though relatively small in size, is diverse in natural qualities. Series host Dr. Doug Phillips journeys across most of Alabama's coastal region exploring the area's rivers, bays, swamps, marshes, and beaches, together with numerous resident plant and animal species. He is joined at various points by local naturalists and wildlife officials to discuss environmental change in the region.

### **Coastal Alabama-Environmental Issues**

Host Dr. Doug Phillips highlights a range of primary environmental issues when he revisits coastal Alabama and examines several of the leading causes of environmental change in the region. Included are interviews with local experts who add their perspectives to the discussion of activities such as farming, forestry, commercial fishing, and overall growth and development on the coast of Alabama.

### **Tannehill State Park**

Tannehill Ironworks Historical State Park has one of Alabama's best displays of buildings, tools, and other lifeway artifacts dating from the period of early European settlement to the time of the first iron making in the state. Host Dr. Doug Phillips presents many of these important cultural features in the context of the park's natural features. Phillips explores Alabama history through visits with teachers at the park's "living history" classroom, discussions with craftsmen who have reconstructed historical log buildings, and visits to the park's unique Iron and Steel Museum of Alabama.

### **Little River Canyon**

Host Dr. Doug Phillips hikes the seventy-mile length of the Little River from its northeast origins near the Alabama-Georgia state line into the final fifteen-mile segment of Little River Canyon. Along the way Dr. Phillips describes the river and the canyon, discusses various features of the area, and recounts several points of local history. The show's opening segment recreates the mid-19th century experience of Union troops who encountered the impassably deep Little River Canyon by surprise as they hurried through Alabama with Confederate troops in pursuit.

## **Caves of Alabama**

With almost 3,000 caves, Alabama ranks among only a few states that have such an abundance of subterranean wonder. Host Dr. Doug Phillips takes viewers on an actual exploration of an unmapped cave in north Alabama. During the journey, Phillips and an accompanying caving expert encounter many common features of caves and discuss how caves are formed, the diversity of geological and biological features that occur in caves, and the history and location of caves in Alabama.

## **Oak Mountain State Park**

More than 10,000 acres in size, Oak Mountain State Park is Alabama's largest state park. The park also happens to be located only minutes from Alabama's largest city, Birmingham. Host Dr. Doug Phillips leads viewers on a hurried escape from the crowded urban scene of downtown Birmingham to the serene setting of Oak Mountain with its forested ridges, valleys, streams, and abundant wildlife. Phillips discusses the geological origin of Oak Mountain, its early history, and the natural attractions of the area as he hikes through the remote reaches of the the park. Later, he is joined by a Birmingham area teacher and her students who regularly visit the park for nature study.

## **Locust Fork River**

Dr. Doug Phillips takes a personal journey when he canoes part of the Locust Fork River in a nostalgic return to the site of his childhood home. But as Southern writer Thomas Wolfe observed in his novel, *You Can't Go Home Again*, things change - for better or worse. On this journey, viewers will learn of the river's past and explore crucial questions about its future. For much of this century, the Locust Fork was familiar only to the residents of its immediate watershed. In recent times, the river has gained attention as more Alabamians recognize its uncommon appeal and as more citizens have grown concerned about changing land practices that pose environmental threats to the river.

## **Moundville**

This video features Moundville Archaeological Park and the mound-building Indian culture of the prehistoric Mississippian Period that lasted from around A.D. 1000 to 1550. The program examines the symbols, beliefs, and the lifeways of this once dominant southeastern culture and traces two centuries of archaeological study attempting to understand these early Native Americans and the significance of their earthen mounds. This video links the science of archaeology with the timeless human quest to understand the meaning of life. The story of Moundville offers a unique opportunity for interdisciplinary instruction in history, social studies, science, geography, and environmental education.

## **Alabama's Natural Diversity**

Alabama often has been viewed as a backwoods region without sophistication. Yet many high-growth urban areas in our country have become synonymous with a stressful lifestyle often associated with noise, traffic, pollution, and crime. In comparison, Alabama's backwoods are no longer equated with being backward. This video presents an overview of Alabama's natural qualities from the state's Appalachian highlands to its coastal wetlands. Alabama's great variety of terrain, of wild habitats, and of native plants and animals ranks the state among the most naturally diverse in the nation. As other parts of our country lose their native natural qualities, Alabama's wildlands help to make our state exceptional.

# Geological History of Alabama

This video presents a brief overview of the geological history of Alabama and describes natural resources in the state. As far back as the 18th century, geologists from other countries were attracted to Alabama by reports of the region's diverse geology. Since then, researchers have pieced together the history of how the landscape and life forms found in Alabama have changed over time. This video follows those changes, from the Earth's formation through the major geological eras (Paleozoic, Mesozoic, and Cenozoic) of the fossil record, and concludes with the recent scientific question of whether industrial societies cause environmental changes that may accelerate geological change.

## A Walk in the Woods

The fields, streams, and woods that once surrounded our schools are being replaced rapidly by shopping areas and adjoining parking lots, while bulletin boards, overhead projectors, and computers are now the primary sources of information. In this video, viewers take a walk in the backwoods and encounter nature on a basic level, a theme which runs throughout the video using quotations from famous Native Americans. Even with the many material advances of our industrial society, we remain dependent upon fundamental processes in nature. The program does not seek to deny the value of technology; rather, the video's essential purpose is to underscore the importance of remembering that our natural environment is the basis of life.

## Alabama Forests

Alabama is one of the most forested regions in the world. The state contains scores of forest communities that provide an abundance of natural habitats, home to a great variety of native plants and animals. A healthy forest is more than merely a collection of trees. It is a setting in which the whole is greater than the sum of its parts because its parts - soil, water, wildlife, various plants and trees - work together to form a self-perpetuating natural community, or ecosystem. This video describes the importance of forests in Alabama while also exploring forest history and key concerns for the future of Alabama's forests.

## Dauphin Island

Dauphin Island is unique among barrier islands because of its special natural qualities and its important role in the history of American settlement. The island has a diversity of natural habitats including marshlands, forests, and lakes. The island also attracted a variety of early explorers including the Spanish, the French, and the English. This video presents both the natural and the human history of Dauphin Island and describes the forces of geological change to barrier islands. The video concludes by looking at environmental changes occurring to the island from modern growth and development and examines the question of how to manage such activities for the island's future.

## Black Warrior River

The Black Warrior River has been prominent in the history and development of Southeastern societies since the emergence of prehistoric cultures many thousands of years ago. In fact, the river's name was taken from the famous Native American Chief Taskalusa (derived from the words *tasska* and *luska* meaning **black warrior**) who encountered the De Soto expedition in 1540. This video recalls the history of the Black Warrior River from the time of early human settlement to the present. We examine the river both in terms of its environmental role and its economic importance, with special focus given to the river's changing status since the construction of a series of dams and locks completed earlier this century.

## **The Sipsey Wilderness**

This video explores Alabama's Sipsey Wilderness Area and tells about the environmental controversy associated with a citizen campaign to preserve the Sipsey in the 1970s. Efforts to gain federal protection for the Sipsey Wilderness sparked an angry national debate revealing society's conflicting desires both to subdue nature and to preserve nature. The video traces this duality from early civilizations to the present, giving particular focus to the rapid settlement of the American frontier. Dr. Phillips recalls the influence of 19th-century romanticism and the emergence of a national movement for the preservation of American wilderness regions.

## **Village Creek**

One of the South's earliest industrial cities is Birmingham, Alabama, a place known for its history of iron and steel production. Often forgotten, however, is the history of Birmingham's natural features that were essential to the establishment of this city. One of those features is Village Creek which flows through the heart of the Birmingham area. Village Creek was originally a pure stream extending across a fertile valley that attracted settlers to the region for the purpose of farming in the early 19th century. As the Industrial Age advanced, Village Creek changed dramatically and has now become a prime example of how uncontrolled urban growth can change the native landscape. This video traces the history of Village Creek and examines the value of urban planning as a means of maintaining a high quality of life in urban areas and preventing environmental degradation.

## **Wildlife History**

Our nation is rooted in a rich, natural heritage that helped define our national identity. Central to this heritage is the history of our society's changing relationship with wildlife. This video gives an overview of Alabama's role as a national leader in wildlife conservation and restoration.

## **Red Hills Salamander**

This video follows a team of research scientists as they go on an actual search for the Red Hills salamander and examine the ecological significance of this threatened species. Private landowners, along with wildlife officials, develop strategies to conserve the salamanders' habitat.

## **Horse Pens 40**

Located atop Chandler Mountain in St. Clair County, this site is a unique ring of large rocks forming a natural corral, used by Indians and settlers for gathering horses, and today operated as a commercial attraction. This video shows the cultural values and natural beauty of historical Horse Pens 40.

## **Alabama Adventure**

Using beautiful nature footage from throughout Alabama, this special presentation is a visual feast accompanied by a continuous musical background for viewers who delight in Alabama's forests, beaches, fields, mountains, rivers, flora and fauna.

## **Long Leaf Ecosystem**

Experts now believe that the Long Leaf ecosystem was at one time the single largest forest ecosystem in the south. This video highlights on-going efforts to better understand and perpetuate the Long Leaf Ecosystem.

## **Wetumpka Impact Center**

In an 1891 report, state geologist, Professor Eugene Allen Smith, noted that the area around Wetumpka was “structurally disturbed”. In this video, Dr. Phillips, along with expert geologists, examine evidence that suggests the altered landscape around Wetumpka is the result of an ancient asteroid collision.

## **Alabama Trees**

In this program, host Dr. Doug Phillips takes an autumn stroll through Alabama woods to introduce viewers to individual members of the forest community and answer the commonly asked question, “shat kind of tree is this?”

## **Native American Festival**

This show reflects on Alabama’s native heritage as we learn the importance of the Native American Festival held each year at Moundville Archeological Park. The show features Native Americans as they demonstrate arts and crafts unique to the Indian culture, play games from long ago and listen to stories about primary tribes, tribal territories, and basic lifeways.

## **Arboretums**

Highlighted in this video are four of Alabama’s arboretums and their significant contribution to the preservation of our native plants and trees.

## **Mobile River Basin**

Few places boast such an abundance of freshwater as our state of Alabama. Join host Dr. Phillips for a journey across 44,000 square miles of the Mobile River Basin, a freshwater drainage encompassing most of Alabama.

## **Fort Morgan**

Visit historic Fort Morgan and witness an active archaeological dig, take a trek through an ancient maritime forest and witness the capture, banding, and release of migratory birds. Fr. Phillips talks to local residents in presenting the past and considering the future of Fort Morgan Peninsula, one of Alabama’s best coastal wonders.

## **Fort Toulouse/Jackson**

Take a journey back in time for a visit to Fort Toulouse/Jackson State Park and the park's annual Frontier Days Festival. Meet Alibamous Indians, French soldiers, Davey Crocket, Andrew Jackson's regiment, and converse with 18th century botanist William Bartram while also learning about the natural appeal of the location.

## **Sipsey River Swamp**

Launch a canoe with Dr. Doug and discover the wild allure of the Sipsey River Swamp. The 100-mile long Sipsey River is one of Alabama's few remaining unpounded rivers, much of it surrounded by river-bottom swamp.

## **Forever Wild**

Alabama's "Forever Wild" land conservation program is recognized nationally for its effectiveness in protecting significant wildlands. This video reflects on the history of how the "Forever Wild" program was established and tells how Alabamians can participate in promoting such land conservation.

## **Dugger Mountain Wilderness**

The Dugger Mountain Wilderness contains Alabama's second highest peak, Dugger Mountain, and is one of several federally designated "wilderness areas" in the state. In this program, Dr. Phillips hikes through the wilderness as he follows the Pinhoti Hiking Trail. Along the way, he encounters many natural wonders while considering the citizens, scientists, and government officials interested in protecting the area.

## **Earth Day**

This video visits Selma, Alabama to join the local school system's annual celebration of Earth Day. Interviews with teachers, students, parents and various officials highlight the significance of this national day of environmental appreciation and give special emphasis to the importance of environmental education throughout the school year.

## **Tuscaloosa County**

The era of "new south" progress has brought important improvements to the southern region. However, parts of the South are also experiencing rapid growth and development that could threaten such traditional southern qualities as abundant natural surroundings and a comfortable pace of life. This video examines Tuscaloosa County, Alabama as an example of a southern community affected by accelerating new-south growth and faced with the challenge of managing this change so as to protect local rural and environmental values.

## **Alabama Soils**

Host Dr. Doug and faithful companion Turkey journey across Alabama to examine the seven major soil areas of the state and learn about the more than 300 soil types associated with these areas. Guest experts discuss the vital ecological function of healthy soil and highlight the importance of Alabama soils to the state's economic and environmental health.

