

DOCUMENT RESUME

ED 290 613

SE 043 844

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 TITLE S.E.E.D. Schoolroom Environmental Experiences for Dayton.
 INSTITUTION Aullwood Audubon Center and Farm, Dayton, OH.
 PUB DATE Oct 87
 NOTE 3lp.
 AVAILABLE FROM Aullwood Audubon Center & Farm, 1000 Aullwood Rd., Dayton, OH 45414 (\$2.00).
 PUB TYPE Guides - Classroom Use - Guides (For Teachers) (052)

EDRS PRICE MF01/PC02 Plus Postage.
 DESCRIPTORS Air Pollution; Controversial Issues (Course Content); *Creative Dramatics; *Elementary School Science; Elementary Secondary Education; *Endangered Species; *Environmental Education; Food; Poisons; Role Playing; Science Education; Secondary School Science; Simulation; *Social Studies; *Soil Conservation; Water Pollution; Water Quality; Wildlife
 IDENTIFIERS *Environmental Education Programs

ABSTRACT

This booklet contains descriptions of four programs that were developed by the Aullwood Audubon Center and Farm (Dayton, Ohio) for educators to present to school classrooms. They focus on environmental issues, involve creative dramatics, and promote student participation in protecting and caring for their environment. "Endangered Animals" (for grades 1-3) uses the bald eagle as an example to help students learn the needs of animals for survival and contains tips for presenting a class play about deciding the fate of one eagle. "Magic Soil" (for grades 1-3) looks at the food we eat and where it comes from. This program emphasizes the need to care for our soil. "Something's in the Water" (for grades 4-6) uses a fairy tale theme in which students help solve the mystery of a poisoned water supply, and then role play in a town meeting to work out a solution to the problem. The last program described, "One Rainy Day" (for grades 6-9), involves the students in an exploration of the complex problem of acid rain. (TW)

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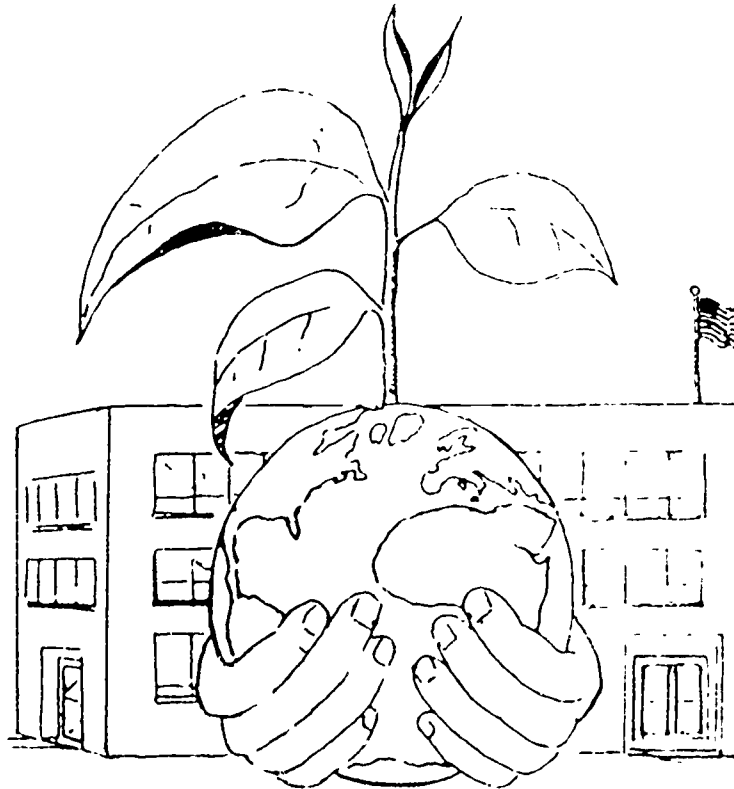
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TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)"



Four exciting programs for grades 1-9, created by the staff of the Aullwood Audubon Center and Farm in Dayton, Ohio for environmental educators to present in schools.

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This booklet was written and prepared by Paul T. Zeph.

Special thanks to Marge Quick for her help in revising this material.

The S.E.E.D. programs were developed by the staff and volunteers of the Aullwood Audubon Center and Farm. Aullwood Audubon is a regional environmental education facility owned and operated by the National Audubon Society.

Additional copies of this booklet are \$2.00 each, and may be obtained by sending a check to: Aullwood Audubon Center & Farm, 1000 Aullwood Road, Dayton, OH 45414. (513) 890-7360.

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INTRODUCTION

This is a booklet of four innovative programs which were developed for educators to present to school classrooms. They focus on environmental issues, involve creative dramatics, and promote student participation in protecting and caring for their environment.

The following is a brief description of each 50 minute program:

Endangered Animals -- Grades 1-3

Using the bald eagle as an example, students learn the needs of animals for survival, and participate in a drama to decide the fate of one eagle. Care for the earth and endangered animals is the central focus.

Magic Soil -- Grades 1-3

A magical look at the food we eat and where it comes from. The program emphasizes the need to care for our soil. Students build food chains (acting out the various parts), and view a slide show about farms.

Something's In The Water -- Grades 4-6

Using a fairy tale theme, students help solve a mystery of a poisoned water supply, then role play in a town meeting to work out a solution to the problem. Could this ever happen to our community? What can we do to prevent it?

One Rainy Day -- Grades 6-9

Students explore the complex problem of acid rain with the help of Tony the fisherman and Professor Whoopee. Also included are group problem solving skills such as brainstorming, generating alternatives, and developing a plan of action.

EDUCATIONAL STRATEGIES

Each of these programs utilizes various education techniques which not only make learning fun, but which also provide examples for teachers on different and exciting ways to teach their students. These techniques include:

- Educational Dramatics -- Students help to act out a story in which situations are provided, but where specific actions are created through their own thoughts, imaginations and emotions. The entire class participates in all programs to provide sound effects or to role play a group experience; and individual class members are brought forward periodically to play specific parts.
- The Use of Fantasy -- Children constantly use their imagination, and create experiences as they begin to make sense of the world around them. Using fantasy in teaching often helps students to conceptualize and better understand what is being taught.
- Concrete Learning -- Children need visual images to make abstract concepts more understandable.

- Involvement -- Students remain tuned in better to what is being presented, and thus learn better when actively involved in a program.
- Valuing -- Young children need affective experiences to develop positive feelings or attitudes about the topic presented; older students are beginning to formulate their own set of values, and need value clarification and moral dilemma experiences to help reinforce the development of positive environmental values.
- Group Problem Solving -- The programs for older students include this component where the students break up into smaller groups to brainstorm solutions, and to work through the pros and cons of various alternatives to solve the problem.
- Student Action -- All of these programs deal with environmental problems, and now humans are having a negative impact on the planet. However, each program ends optimistically by having the students share out ideas they have on how to prevent the problem from reoccurring or from getting worse; and the children are left with a sense that there is something that they can do to get actively involved in making their communities and the planet a healthier place to live. Follow-up suggestions are also left with the teacher to encourage class activities in their community.

USING AND ADAPTING THESE PROGRAMS

The four programs presented here were designed to meet the needs of Dayton area schools, and have proved very successful there. you may find that you can use them as is for your facility or school, and if so feel free to use them in any way you would like. Our only request is that you let us know how they worked for you.

On the other hand, you may find that the ideas and components of the programs are more useful to apply to other environmental topics or concepts that you want to teach to your students:

- Cards with magazine pictures glued on, or hoods made from grocery sacks are enough to spark the fantasy in children and transform them into any creature, plant, cloud, person, or structure.
- Sound effects are a fun way to become weather, a spring frog pond, construction equipment, farm animals, or a spaceship.
- Body movements can create leaves in autumn, flowers in spring, falling snow, flowing water, or any type of machinery.
- Valuing activities can be used any time to help develop positive environmental attitudes and a desire to want to get involved in solving problems.
- Community problem solving gives students the skills and experiences which are so important for their involvement in future local, national, and global problems.

ENDANGERED ANIMALS OUTREACH PROGRAM SCRIPT
(Grades 1-3)

Animal Needs

Both leaders introduce themselves and Aullwood. One leader does the talking while the other holds up props and chooses students for parts. Introduce Muffin, your pet dog (hand puppet). Children may want to pet Muffin. Ask children if they have pets, and what do they do for the pets---what do their pets need to live? (food, water and place to live). As each of these needs are suggested by the students, the corresponding prop is brought out and placed on a desk or table (food and water dishes and dog house). Then the three cards with each need written on it can be set up in a line for the students to see. Introduce a new vocabulary word for "place to live"----HABITAT. Tell students you will be using this new word in place of the old from now on and write it on a chalk-board.

Tell children it is time for Muffin to go to sleep, take him off and put him in the dog house for a nap. Discuss how other animals don't have a boy or girl to take care of them, and they must find food, water and habitat on their own.

Local Park

Ask the class the name of a park that is near their school. Tell them that we are all going to rebuild that park (with a little imagination) here in the classroom. Have class imagine what the park looks like. As they suggest grass, trees, rocks, water, or houses, pull out each corresponding prop and put in position on stage right (to leader's right). If there is no water in their park, have them imagine water in this one.

Now ask what animals might live in or use the park. As the children suggest a snake, fish, bird, rabbit, and child (baseball player), choose one student for each part, put on the appropriate hood/hat, have them choose a habitat in the park, and move to that spot as their animal would. Summarize that in the park, each animal finds food and water in their own special habitats.

Mention to the park characters that we will be leaving the park for a short time, but we will be coming back to them again. Ask them to stay seated in the park where they are, but suggest that they take off their hoods if they get hot until we return to them. (At this point, the second leader goes into the hall to put on the eagle costume).

Eagle

Tell the class that we are now all going on a hike. Have everyone stand and begin to hike (in place). Then act out climbing up a hill. "Whew! So tired! Let's sit down on the top of this hill and rest". Class sits back down as you continue. "Wow! Look down there at the bottom of the hill! A lake, tall trees, and lots of fish in the lake". (As you describe what you see, pull out each prop and set it up. Children hold up the two cardboard trees.) And on one tree is this strange thing!

(Choose another child to hold the nest above one of the trees.) "What is this thing?" "Who do you think might live here?" "Oh, I hear something!" Eagle makes a cry in the hallway, then enters room and soars around. Eagle picks up a fish, drops on ground, eats, soars more, checks nest, soars, and leaves room. As eagle is doing the various things in room, other leader asks class what he is doing. Mention how an eagle uses the same nest year after year, and the eagle probably left to find some new material for the nest.

After the eagle leaves the room you suddenly perk your ears and look toward the habitat area (remembering you and the class are still up on top of the hill looking below). "I hear noise, lots of noise, and people all around..." Bring up 2 students to be tree choppers and put them by one tree. 2 students to be lumberjacks to use chain saws to cut down the tree. 2 trash throwers (put them by the pond and give them trash to hold and 1 bulldozer driver (have him sit in a chair up front). Place these students in position (not blocking view so other class members can still see the whole set), but don't tell them what they are doing yet. Then say, "let's get these trees down, have to build roads and houses here now"!

Stop for a moment and divide the seated class up into 4 groups for sound effects: 1) "chop, chop" 2) "saw, saw" 3) "trash, splash" 4) "rrr-rrr". Have each group practice their sound separately. Then on the count of three, tell each group to make their noise over and over, while the construction workers chop and saw down the trees, (place the nest on the ground), the trash throwers throw the trash in the lake, and the bulldozer moves around. Supervise the trees falling, and place the fish along side the lake to indicate they are dead. "O.K. guys, we're all done here---trees are all cut, road is in, ready for houses, look at all those dead fish---oh, well, so what?"

Construction workers sit down, and narrator resumes hike leader role. Leader looks at mess from atop the hill, gasps, wonders what the eagle will do when it returns. As the eagle comes back in and surveys the destruction, the other leader narrates in a low voice or whisper----- this should be an emotional moment for the children. The eagle goes to find the nest and it is on the ground; no trees; goes to get fish in the lake but passes over it as it is polluted; then finds fish on side in the the lake but passes over it as it is polluted; then finds fish on side and tries to eat, but since it is dead the eagle cannot eat it. Eagle soars weakly and sadly, then slowly moves to floor behind habitat area with back to class, and dies with a soft mournful cry. All should be quiet---usually dead quiet as children realize what has happened. Eagle lies still for a moment, then slowly takes off outfit.

Endangered Animals

The eagle person quietly stands up, brings the outfit along, and comes forward to talk to the class. "I was the eagle, but you see what happened" (holding up costume). "You see what happened to the habitat. Eagles don't always die from eating poisoned food, sometimes the poisons make their eggshells thin so when the mother eagle sits on them the eggs break. When trees are cut, eagles must go elsewhere to live---if there are any places left. The Bald Eagle is called an ENDANGERED ANIMAL

because there are not too many of them left in the United States. There are only a few pairs left in Ohio.

Destruction of habitat is happening all over the world, and animals are also losing their food and water. In Ohio, we used to have other animals living here that had to leave or were killed. They were: bison, elk, wolf, bear and bobcat" (Hold up pictures for each animal).

Park Destruction

Turning back to the park, "What could happen to these smaller animals? Could they lose their food and place to live? If the lake was drained, (remove lake) what happens to the fish? (Have the fish student do what they feel a fish would do without a lake). Can it find new food and shelter? In Ohio, many fish and water animals are endangered. What about the snake? (Take away the rock) can the snake find new food, water and shelter? Two types of snakes are endangered in Ohio. What will the bird do if the tree is cut down? (Knock over tree) Have bird fly to find a new home. Six types of birds are endangered in Ohio. And the rabbit? (Take away grass) Rabbits can live close to humans, but other animals are not so lucky. If the park is paved, where will the baseball player play? Are humans (us) affected by the destruction of natural areas in Ohio or elsewhere in the world? We are not an endangered animal, but we are affected. Polluted water and air can hurt us, trees give us oxygen, natural areas give us beauty. WHAT CAN WE DO"????

Restoration and Protection

With all the children sitting with their class, ask them what we can do---allow them to think for awhile, it's important for them to come up with suggestions. Clean up trash! (Give a plastic trash bag to a couple of students and have them clean up the trash in the lake. Be sure to use students not used before.) Plant trees! Pick several students to place the small trees around the lake where they choose. Preserve areas and protect animals! (Have one child come up and hold "protected animals" sign.)

There are many people and groups in the United States and in Dayton, Ohio who help to save animals. The National Audubon Society is one group, and you can come to Aullwood to find out more about what we can do.

We have fixed up the eagle's habitat, but it will take many years for the trees to grow. Maybe, just maybe some day an eagle will return to make a nest in the trees once they are bigger.

We want to end the program with a song to put us in touch with the Eagle Spirit, so that he can help us to save habitats for endangered animals.

Hand out uncoloring page to students, and put props away.

ENDANGERED ANIMALS PROGRAM PROPS

Animal Needs

- Dog hand puppet, pet water dish, and food bowl
- Cardboard dog house for puppet
- Stand-up cards (made from foam core)
 - 1) "Food" (with a picture of a food bowl)
 - 2) "Water" (with a picture of a water bowl)
 - 3) "Place to Live" (with a picture of a dog house)

Local Park

- Cardboard stand up tree
- Cardboard stand up rock
- Blue felt pond
- Green plastic grass doormat or piece of astroturf
- 14" X 24" picture of a house
- Animal hoods for students: snake, fish, rabbit, bird
- Baseball cap

Eagle

- Bald eagle outfit: yellow beak, white hood, brown wings, brown pants and shirt
- 2 cardboard trees
- 1 nest (grapevine wreath with sticks)
- 1 large blue felt pond (4' x 5')
- Plastic fish (5-6)
- Bag of trash (paper or plastic sack with motor oil can, fast food wrappers, pop can, styrofoam cup)

Endangered Animals

- Posters of endangered animals in your state, or animals which used to live there (glue onto "foam core")
- Poster of eagle

Restoration & Protection

- 3 cardboard tree "seedlings"
- Small plastic fish (5-6)
- Sign that says "Protected Animals" (24" x 24")
- Coloring page for each student

"Endangered Animals" Follow Up Activity Ideas

Science

"Invent an animal" -- use crafts materials to create creatures that have features which would allow them to survive in a certain habitat (consider camouflage, protection, food to be eaten, shelter, living with people or pollution).

Create pictures, murals, or mobiles of an eagle's habitat, or an eagle food pyramid.

Construct bird feeders out of drink cartons or other materials -- learn the best foods for our birds.

Discover the habitats in the schoolyard and search for animal signs during the different seasons.

Improve the school site to encourage more wildlife -- the county Soil Conservation Service has publications on plantings that attract wildlife. Set aside a piece of unused schoolyard to let it grow natural -- plant trees, bring in a few dead logs and boulders, make a small meadow.

Investigate what farmers can do to help and encourage wildlife.

Subscribe to Audubon Adventures for the classroom. For information write: Audubon Adventures, National Audubon Society, 613 Riversville Road, Greenwich, CT 06830.

Social Studies

What was your County or state like when the pioneers came? How has it changed, and how has this affected the animals which lived here then?

What animals no longer live in the state because of humans? What kinds of animals live here now? Are any of them in danger?

What can people do to help wildlife? What can your local government do?

Language Arts

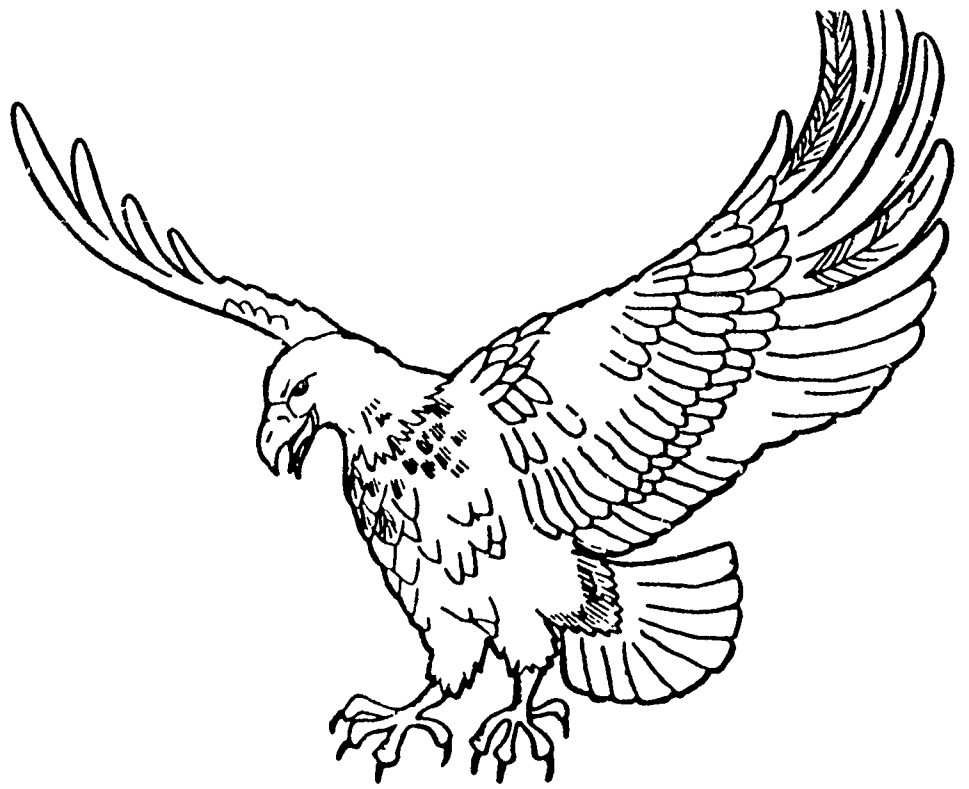
Create puppet shows or dramas of endangered animal stories.

Make up or find poetry and songs about animals.

Read stories from books or magazines about animals. (See back issues of Audubon Adventures or Ranger Rick magazine).

Games

For numerous animal and environmental games, see Sharing Nature With Children by Joseph Cornell (available from Anaconda Publishing Co., or from Aullwood Audubon Center & Farm, 1000 Aullwood Road, Dayton, OH 45414).



All animals need certain things to survive. Draw what this Bald Eagle needs to live a healthy life.

THE MAGIC SOIL
(Grades 1-3)

In center of room is a clear plexiglass box of peat soil - inside box are fabric vegetables hidden with tops just under the soil. The box is covered with magic cloth (a black cloth in sequins, half moons, etc.). The two leaders introduce themselves and are about to begin, when "A" whispers to "B" that she has to get a drink of water. "A" goes out of room while "B" straightens out props.

"B" - (Goes to box - looks under cloth - pantomimes all with great care and excitement; mentions to class that he hopes "A" returns soon so they can begin the program).

"A" - (Enters with seed and has questioning look on her face.) Hey, "P". look what I found, but I don't know what it is. What is it? (Hands to "P" a large fabric lima bean.)

"B" - Wow! I don't know - let me get a good look. (Using all of his senses, he examines the seed.) A-ha! It's a seed.

"A" - A seed - well, what should I do with it?

"B" - I've got a perfect place to put it! Under here! (He points to the cloth.)

"A" - Oh! What's that?

"B" - A magic cloth!

"A" - Magic?

"B" - Magic! (He unveils the box)

"A & "B" - (Together) Ah-h-h! (Ceremoniously the cloth is removed from the box and the words "Magic Soil" which are on the front are spelled and read with the students.)

"B" - Let's plant your seed in the magic soil and see what happens! (Plants seed, making large gestures of care over the box.) But, for the magic to work, everyone must help - all of you out there. Will you help the magic work?

("A" starts snapping fingers) Oh, I felt a drop. The magic is beginning - it's raining. Can you help it rain? (Here "B" teaches class how to make rain sound: snap fingers, then slaps thighs, then snap, and fade away.)

"A" - Look! (she points to the sky) The sun is coming. Hurray!! for the sun. For it will shine, shine, shine. ("A" has group shine, shine, shine by thrusting arms skyward with fingers stretched out wide.)

"B" - But, we need more rain - Come on everyone - (rain sound again - slapping thighs only).

"A" - We need more sun - (shine, shine, shine - with hands)
(This is repeated faster and faster)

"B" - Rain

"A" - Sun

"P" - Rain

"A" - Sun

(Until both A & B fall on floor exhausted, get up slowly and B slowly creeps to box and looks in.)

"B" I think the magic is working!

"A" - You think the magic is working?

"B" - I think the magic is working! (This is repeated in rhythm with the class until all are saying it - as it is repeated - he pulls out a vegetable and shows excitement.)

"A" - It's my turn, can I try?
(Pulls out another vegetable and shows delight while "B" continues the chant with students.) ("B" pulls out another, then "A" pulls out a hamburger. Here - both A & B stop and freeze in an exaggerated manner - get close and look at hamburger and then turn to look at each other. They do this twice, then hold up the hamburger and go to kids.

"A" A hamburger! From the soil?

"B" (Shakes his head that it does) and says, Yes, Yes, Yes.

"A" (Disdainfully) Hamburger from the soil? Really, next you're going to tell me that everything I eat comes from the soil.

"B" It's true! Everything you eat does come from the soil. I'll show you yet. (slapping his finger at A, pacing and thinking) I've got it! Now I need your help, (encouraging the kids). Will you help me? (Children respond) The first thing I have to do is find one of you that looks like they could turn into a hamburger. (He reaches for a child) Ah ha!! (Bring child up front and gives him hamburger card on stage left). Now what other meat do we eat? Something that sizzles in the morning and you go yum! yum! (Children guess bacon) Bacon - who wants to be a piece of bacon - ah yes - a lean sizzling piece of bacon right here. (Hands out bacon card on stage left).
And now one more meat that you eat for dinner. It comes crispy, plain or (in a Southern drawl) Southern fried -- (with that, children say chicken) Yes siree -- here's the best looking chicken drumstick right here. (Hands out drumstick card on stage left) O.K. Now then, you are our juicy hamburger, you are a delicious piece of lean bacon, and you are our crispy drumstick. What a gourmet delight - let's head out for them. (A on side clapping)

"B" But where does this food come from? Where do you come from? (to hamburger) Where do you come from? (to bacon) Where do you come from (to drumstick) (Say this quickly as you do not want an answer or response from students yet)

Now, I really need help for those answers. (begins pacing again, thinking more) I'm going to have to have (pause and look at audience) children and magic! Ah-ha - the cloth. (He hurriedly grabs cloth and asks 2 teachers, or 1 teacher and 1 student standing on a chair to be the magic cloth holders. (He hands them the cloth and it is stretched out with bag of hoods behind - stage right - "A" gets behind cloth, helps cloth holders, then stays back there. Now maybe the magic cloth can tell us where all this food comes from! Let me go ask the magic cloth -- (runs to cloth) Oh mighty and mystical cloth, where does all this food come from? (A in a loud whisper says "the soil!") It says everything you eat comes from soil. (B quickly looks at box of soil and repeats line.)

Oh, dear, how can the cloth help me to prove that everything we eat comes from the soil? Let me see. (pacing) You are a hamburger - right? (takes student and places him behind cloth on stage right) You are a piece of bacon - right? (again places student behind cloth on stage right) You are a succulent drumstick - right? I think I'll have you for lunch (he starts out the door with him). Just kidding (puts him behind cloth on stage right) (A is behind curtain and gives them their hoods and puts them on.)

"B" (Puts fingers to his lips and gets everyone quiet) Now, for the magic - (goes and checks behind the curtains again) Oh my gosh!!! They disappeared! (looking frantically) The magic worked too well! What shall we do? (comes front to audience and talks) I know how to make the magic work! You rub your tummy like this - can you rub your tummy? (children rub their tummies) Now repeat after me.....

Children - Abra ca da bra, yum yum, let the magic be done. (repeated until all are singing, "B" practices with them)

"B" (With that he lifts aside the magic cloth and there stand the same children with hoods of cow, chicken, and pig - holding original cards so relationship is more vivid)

It worked! - look - they're back - but look at what happened to them - our hamburger is a cow (bring students forward a little) - the piece of bacon is a pig, and oh my - our drumstick has turned into a chicken. (turning to the two holding the cloth) Wow what a great job you did - all of you. (two holding cloth sit down stage right) Now that we have a chicken, cow, and pig, we'll have to find food for you - what do all of these animals eat?

"B" Cow - what do you eat? (answers from audience) Grass and corn.

Pig - do you eat grass or corn? Yes
How about you Chicken? - corn!
Well, if all of you eat either grass or corn - we'll have to have some grass and corn won't we? (to audience) Would you help us grow grass and corn so these poor hungry animals can eat? (two children from audience come up and get grass and corn cards to hold and stand stage left.

And now we will turn the animals out to pasture (takes food cards from animals) moves the cow, chicken, and pig to grass and they mime eating, then "P" puts food cards where cloth is held up. My, what a lovely sound animals make when they eat - they say munch, munch, munch -- let's all munch with them and help them eat. (repeat several times) "munch, munch, munch"

Now A - I proved it to you! I showed you that the hamburger was the cow, the bacon was the pig and the drumstick was the chicken - that ate the grass and swallowed the grass that grew in the soil that lay on the ground that drank the rain and held the sun. Whew! (as he says this he runs around and mimes all - retires to floor. From the floor, tiredly) Now A, you see everything you eat does come from soil (and collapses).

(A runs to him, lifts his head and body saying)

"A" I see, I see, I understand, and just to prove it, I'll show you, watch and (drops him flat). ("B" moves to side to watch. Now I'll clear away everything and start from the beginning. (clears stage) First I know I need soil, who will be that wonderful, wonderful thing called soil. Ah--(places a child on the ground with care and concern).

"A" Corn and grass is what we need next, to feed the animals, so I need seeds, right? (Pretends to pluck seeds from the corn and grass children who have been moved aside.) One seed, two seeds. (Brings the two children over and plants them in the soil.)

Now, what do I need for the seeds to grow? (Audience says "rain" and "sun") In the spring the rain flows gently down, (snaps fingers as before with audience help). A cloud breaks and the sun breaks through and shines, shines, shines. (with arms with audience as before.)

Now I'll just take a peek and see if my seeds have been nourished by the soil, the rain, and the sun. Ahh - look - the grass and corn are growing. ("A" helps the children to rise slowly). There! Nice corn and grass - I know of some animals who would love to eat you! (She goes to check and ask the chicken, cow and pig if they are hungry). Cow, chicken, pig, there is new grass and corn to eat in the pasture that came from the seeds I planted in the soil, come follow me and eat. (animals are led to pasture and begin to eat) Let's help them eat (audience responds, "munch, munch, munch").

(As they eat "A" begins to test them to see how fat they are becoming. "A" rushes and puts up magic cloth, stage right with the 2 cloth holders - and places sign saying "market" on cloth. She spells out market for audience. "B" goes behind curtain when up. "A" rushes back and checks them again and one by one takes them behind the curtain, where "B" takes off their hoods and gives them corresponding sign stating hamburger, bacon, drumstick. As each one goes behind curtain, animal noise is made by "B" and they are brought right back out as the food by "A".

"A" And now, "B" I showed you what I learned! I planted the seeds in the soil which grew into corn and grass that fed the cow, that the pig, that fed the chicken, and they all got big and went to market to become --- a hamburger, bacon and drumstick for my hungry, hungry tummy. (As this line is said, she goes to each place from soil to market to hamburger, bacon, and drumstick.) Now I see, everything we eat comes from the good, good soil (goes to soil box) Let's hear it for the soil -- YEA! YEA! YEA! See "P", I do understand. (Thank students up front, and have everyone sit down)

("A" wanders to box of soil and becomes sad. "P" comes to give "A" congrats)

"B" Yes, "A", you certainly do understand!
But.... why do you look so sad?

"A" Because I can't grow enough food for all of us from this small box of soil.

"B" Don't be sad, there are places where there's lots of soil and we can grow lots of food.

"A" Really! Where's that?

"B" Come with me - but before we go, put these on (puts on overalls and hat) "Now do you know where we are going"? (A still is not sure) Ask same question to audience -- "farm" is usually the response. "OK! Here we go on a trip to a farm!"

(Here lights go out and 5 minute or less slide show on the farm with background music. Has pictures of cows, pigs, chickens, sheep, horses, rabbits, corn, hay and soil.)

"A" Wow! That's great "B". I learned something very special today. Everything I eat comes from the soil, and if everything I eat comes from the soil, then I am part of the soil and I should thank the soil. (at center with soil box) A and B thank soil by bowing - then ask the children if they would also like to thank the soil.

SONG TO THE SOIL

(To the tune of row, row, row your boat)

Sing, sing, sing a song
To our special soil
Thank you, thank you, thank you, thank you,
Thank you special soil!

Leaders sing song once, than again with the children.
Leaders thank class for allowing them to come, --- invite everyone out to Aullwood, and give teacher worksheets for students.

MAGIC SOIL PROGRAM PROPS

- Plexiglass box with no cover - 21" X 14" X 14"
filled with dried peat
- Magic cloth -- 6' X 6' black material with sequins,
stars, moons, sun, etc.
- Cloth, life size vegetables of carrot, radish and onion
(plastic will do but fabric looks more life like)
- Fabric hamburger
- Cloth lima bean 4" X 2 1/2"
- Cow hood, pig hood and snout, chicken hood and beak (in a bag)
- 2 pairs of overalls
- 2 straw hats
- 24" X 14" cards made out of "foam core"
 - pictures of hamburger, bacon, and drumstick
 - pictures of grass and corn
 - sign spelling "Market" with velcro glued on top of back
so it can attach to magic cloth which has velcro attached
to top of front
- Short slideshow of farm with animal pictures, corn, and grass,
with bluegrass music background
- Copies of coloring page for students

"The Magic Soil" Follow Up Activity Ideas

Science

- Discover what ingredients are in soil.
- What does a farmer consider "good soil"? What kinds of things happen to farmers' soil?
- What litters the land? Make a mobile or collage of things found in the school yard.
- What can farmers do to protect their land? What can you do to protect the land?
- Beautify a sore spot in your school yard
- Start seeds inside and then plant in spring.
- Put seeds in different soils and see what happens to their growth.

Language Arts

- Write a narrative or a poem as a class -- talk to your soil and thank it.
- Write a narrative on life as a seed and what happens to the seed.
- Pantomime a seed from its beginning to a tall plant. Imagine what happens to it -- blown by wind, part of it broken off -- food for another? or does it die and return to the soil?
- Construct a puppet show of food chain animals on the farm. Use farm songs or music -- such as "Old McDonald", or Pete Seeger albums.
- Have students mime what makes up good soil -- act out what causes poor soil.
- Storytelling: There are many good farm & vegetable/food stories that can be told or acted out with a dramatic flair.

Social Studies

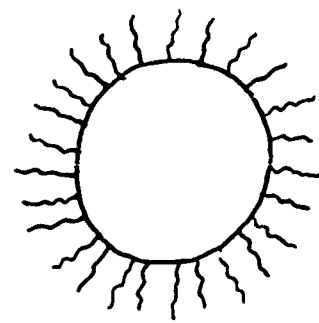
- What was your state's land like when the pioneers came? How has it changed?
- What do the farms in your state produce?
- What kinds of crops did the Native Americans eat, and how did they grow them?
- What can you grow to eat on the land in your community? Could your community feed itself? Where does the food come from that you buy at the grocery store?

Music and P.E.

- Musical instruments from things grown from the soil.
- Rituals that Native Americans used with soil.
- Folk dances from farm life.
- Farm songs.

Art

- Clay and sand sculpture
- Draw layers of the earth.
- Mobile or collage of schoolyard or roadside litter.
- Drawing or painting what we get from the soil.



Humans depend on soil for all of their food. Draw what you eat that comes from soil.

"Something's In The Water"

For 4th - 6th grades

Storyteller (one of the leaders) begins by picking up a large book with a picture of a castle on its cover, opens the book and begins reading to the class: "Once upon a time there was a happy kingdom, called Hamelot, ruled by the beloved King Smedley" (Other leader brings up a student, puts a crown on him, hands him a staff, and sits him in a chair with a picture of a castle behind him). "One day, some of the kingdom's children came inside from the playground to get a drink of water." (Bring up five students and hand them each a plastic cup.) "They each went over to the fountain, and filled their cups with cool, clear, sparkling water." (kids go over to a cardboard fountain and pretend to fill up their cups). "They each took a long drink, and were about to go back outside; when all of a sudden, one by one the students began to feel ill. Some had bad headaches, others had stomachaches, and others felt dizzy and had to sit down on the floor. The children were admitted to the royal hospital for tests." (At this point, the storyteller puts on a white lab coat while the other leader goes out into the hall to put on a detective costume. The leader in the lab coat walks over to the students, examines them, and says: "You drank some poison, but luckily not enough to do any permanent damage. The best thing for you is to go home and rest." Storyteller takes off lab coat, picks up book again, and says, "When the king heard what had happened, he sent for the Royal Detective."

In walks the other staff person dressed like Sherlock Holmes. The storyteller reads from the book: "The king told the royal detective that there must be something in the kingdom's water that made the children sick, and that his job is to find out what it is. The detective bowed to the king, and began thinking." The detective now takes over the speaking.

The detective says to the audience that before he can begin his investigation, he needs some help-- two assistants to be exact. He brings up two volunteers, and gives them detective hats to wear. As he paces about thinking, his assistants follow behind rubbing their chins. He asks the audience what the first thing is that he should do-- decides to have the water tested. He chooses someone from the audience to be a lab technician, gives him a large, white lab coat, and a card to read. The detective then gets a sample of tap water in a plastic beaker, and gives it to the technician. He then asks the technician what the results of his testing is, and the technician reads: "My lab tests show that there is a poison called "fluff-oxin" in your water." The detective thinks hard, wonders out loud how fluffoxin could have gotten into the water supply, then decides we need to trace the water back to its point of origin. He then begins a process of tracing the water from faucet to underground source.

One student comes up to hold a cardboard cutout of a water faucet. Another holds a cardboard picture below it showing the pipe system from faucet to outside of house. Two students then come up to hold both ends of a pipe which is the water main from the kingdom water supply to the house. (Use the detective assistants to hold

two items so they have something to do) Another student holds a picture of a pumping station which pumps the kingdom's water from underground. Finally, the detective sets up a collapsible cardboard table to indicate ground level-- the front of which is a picture of the well underground and the water in the rock layers. (While the storyteller is setting up the table, the detective holds up the underground picture and talks with the class about the water table-- how rain trickles down through the ground until it reaches a layer of rock, then backs up and forms a "lake" underground from which we can pump water to use.)

After a quick review of water-from-ground-to-faucet, the detective and the storyteller put aside the sink, watertower and pipe props, and tell the students holding them to sit down. On stage still are the king, detective and assistants, and the student holding the pumphouse on the table. The detective then walks around and around the pump station, followed by his assistants, to see if he can find anything that would be polluting the water supply. On one of his passes in front of the cardboard table, (with his back to the audience) he pulls two "fluffies" from his pocket and sets them on the table above the well (fluffies are tennis ball-sized balls of fluff). He then moves away from the table, sees the fluffies in surprise, looks at them with his large magnifying glass, and says AHA! He decides to send one to the lab to have it analyzed-- gives a fluffy to the technician with another card to read-- then asks the lab technician what his lab results are, and the student reads: "After a complete study of this thing, I have determined it to be a fluffy-- which is the waste material from the making of floor wax. When rain mixes with fluffies, the poison fluffoxin is produced".

"By George!" says the detective. He then repeats what the technician said. "The fluffoxin then trickles down through the ground into the water supply! The fluffies are the problem-- but where are they coming from?" The detective decides to form a stake out to watch the area to see where the fluffies are coming from. He and his volunteers move to the side, each hides behind a cardboard bush with their sides to the audience and facing the pump area. The storyteller then puts on a hard hat, chooses two students, puts hard hats on them, gives them rubber gloves to wear and gives each some fluffies to hold. They walk over to the pump table, dump an armload of fluffies onto it, and leave. The people in hard hats go over to the other side of the stage and sit behind a large cardboard picture of a factory. The detective has been watching all this, and with an "Aha" he and his assistants go over to the factory.

At the factory, the detective asks to speak to the owner. The staff person with the hard hat says he is the owner. The detective hands the assistants each a card with something to say to the owner about the fluffy problem (assistant 1: "You're dumping your fluffies around our well, and poisoning our water!" assistant 2: "And we want to know what you are going to do about it!") The owner says there is nothing he can do-- there is no law against dumping the fluffies there, and to do anything else with them would cost his company a lot of money. The detective says he'll report this to the king and see what he thinks about it. The detective assistants sit down, and the detective goes over and

stands next to the king.

The storyteller resumes his role, and reads: "Back at the castle, the detective quickly tells the king all he has learned. He then suggests to the king that the kingdom be called together for a meeting at the palace to solve this problem." As the storyteller takes down the table with the pumphouse picture, the detective brings forth an easel with a large card on it with the problem:

- company makes fluffies as a by-product
- fluffies mix with rain to form fluffoxin
- fluffoxin trickles down through the ground to the water supply.
- water is pumped into homes for people to use
- people get sick

The detective then tells the class that they are the townsfolk at the meeting of the kingdom, and the class will decide what to do to solve the problem. The first step is for the class to generate a list of alternatives to solving the problem-- as alternatives are mentioned, they are written on a piece of newsprint for all to see. Then the students are split into two groups: concerned citizens led by the detective, and factory employees led by the storyteller wearing a hardhat. One group stays in the room while the other group goes into the hall or somewhere else for a few minutes, and each group discusses their "role"-- that is, what their concerns are about the problem (the citizens are concerned about the health of their children and themselves, about the poison affecting plant and animal life, and about the possibility of this poison causing cancer or death; while the employees don't want the company to spend much money because they could lose their jobs or the company could go out of business.

Then all alternatives are discussed by the class. The detective (or the storyteller, or both-- whoever feels comfortable doing this) leads a discussion of the pros and cons of each alternative. As each alternative is brought up, the discussion leader asks the citizens if they like it and why (or why not), and asks the employees the same. The students are encouraged to rebut with one another while the leader moderates the discussion. (NOTE: if there are a lot of alternatives to discuss, it is best to consolidate them into a few main choices to limit the time). When discussion is completed, a hand vote by the class decides which alternative will be adopted (passing laws, factory paying, consumer paying, government subsidy, whatever.)

The storyteller then resumes his storytelling role. He sums up the solution that the townspeople chose, then ends by saying that the kingdom was safe and healthy, and lived happily ever after. The storyteller then closes the book and so ends the fairytale. Now out of costume and character, one of the leaders asks the class if something like this could ever happen today. Toxic dumps are discussed, along with chemicals dumped into rivers where many communities get their water, and chemicals that seep through soil (e.g. Florida where the orange tree pesticides have penetrated the sandy soil and are in the water supplies of many communities). Also discussed are ways that each of us contributes to the problem (automobile oil leaks, pouring chemicals down drains in home and

street, etc.) To help the students visualize this, slides are shown that illustrate many of these problems. Then discuss ways to protect our community's water supplies, for once chemicals get into the water, they are there for good.

END OF PROGRAM

Follow up materials for teacher will include suggestions on investigating where the students' water comes from, if the area is protected by any laws, etc. Perhaps someone from the community government would come in to talk to the class about it. Letters could be written by the students, site visits, etc.

NOTE: Important things to emphasize throughout this program include:

-We are all part of the problem

-In order to solve these complicated problems, we all must work together

-Chemicals in water do not only affect humans, but also any living thing that uses water to live or grow. Some humans can buy a filter for some chemicals, but the poor cannot and animals and plants cannot.

One last note: check with the teacher before you begin to see if there are any students who are non-readers, so you don't pick them for a reading part-- this could be very embarrassing for the child.

DISCUSSION FOR GROUP BRAINSTORMING ON FLUFFOXIN PROBLEM

<u>Possible Solutions</u>	<u>Pros</u>	<u>Cons</u>
Close factory	no more fluffies	unemployment
Sue factory	stop dumping	still have fluffies
A law against dumping	stop dumping	still have fluffies
Burn fluffies	no more fluffies	fluffoxin in air
Bury fluffies	out of sight	can still mix with groundwater
Send to moon	rid of fluffies	costs millions of \$\$, and what if rocket blows up?
Build storage bldg	keep fluffies dry and contained	must store for thousands of years, need more and more buildings
Filter water	wouldn't drink fluffoxin	what about animals and plants? what to do with fluffoxin in filter?
Have factory make wax a new way	no more fluffoxin	need \$\$ to retool factory and retrain workers
Have factory make a different product	no more fluffoxin	need \$\$
Make something out of the fluffies	no fluffoxin	need \$\$ for research and new factory to make new product

Try to steer toward a cooperative effort -- the last three solutions are generally the ones the kids ultimately choose. Money can be raised through taxes (everyone pays a little), the factory owner paying, or the king (government) paying. If all three give a little, it is easier on everyone. Sometimes you get a generous king who says he is willing to pay the entire bill!

"Something's In The Water" Follow Up Activity Ideas

Water Investigations

Have students collect data from their homes on water usage. (Gallons per flush X number of flushes per day, sinks, dishwasher, laundry, showers, etc.) Multiply by number of class members. Do percentages, averages, graphs. How can the wasting of water be reduced?

Investigate where the students' water comes from. Have students write or call local government. Who is in charge of the water? Have them ask if someone from the water department would come into the class to explain where the water comes from. Perhaps a field trip could be arranged to visit the water department, or they could send information to the students.

What state agencies are responsible for protecting the water? What laws exist to protect drinking water? Are they strong enough? Are they enforced?

Is the well field or river from where the water is pumped protected from possible chemical poisoning? Are there any dumps nearby? Are there any local laws to protect this water supply? Have the students ask these questions on a visit or in letters.

Where does the students' waste water go once it leaves the school or home? Who and what uses the water after it is processed? Where is the water processed, and what is done to it? Does all of the water from the community go there? What industries in the community send chemical waste into the waste water?

Have the students collect news articles on water and toxic chemicals. These could be read in class and used for discussion, or kept for a class scrapbook or collage.

Student Education Ideas

Start a campaign to educate the other students in the school about home chemicals and their safe disposal. Have each student develop an advertisement for their parents about safe disposal of dangerous chemicals. Write letters to the local newspaper or the school paper about water and its protection.

Have the students find out who their elected local, state, and national officials are. Write letters to these people to find out what they are doing to keep the drinking water safe.

Useful References

Local and State Environmental Protection Agency (EPA).

The League of Women Voters (For the address of the League and EPA, check the local telephone directory).

"Toxics In My Home? You Bet!" for grades 7 - 8 is one of four curricula on household hazardous substances available from Golden Empire Health Planning Center, 2100 21st Street, Sacramento, CA 95818 (916) 731-5050.

Props for "Something's In The Water"

Crown (cardboard) and staff (dowel) for king

3 Sherlock Holmes hats

Sherlock Holmes cape and magnifying glass

10 "Fluffies" -- furry material sewn into tennis ball-sized globs
stuffed with polyester

Large storybook (1 1/2' x 2 1/2') made from cardboard

White Lab Coat

5 plastic cups

Drawings of: Sink (2'x4')
Water pipes in house (2'x4')
Water tower (2'x4')
Pump house (2'x2')
Underground cross section (2'x2')
Factory (3'x'5')
Castle (3'x'5')

2 2' pipe (curtain rod) sections

2' high table to rest pump house picture on

Easel and 1'x'2' card stating water problem

Newsprint and marker

Index cards for students' scripts

Slides of toxic wastes and other chemical pollution

ONE RAINY DAY
Acid Rain Program for jr. high

(Narrator sits on chair with a large storybook. Tony is introduced and wears a fishing hat).

Nar: "One bright sunny morning Tony decided to go fishing. He grabbed up his fishing pole and a can of worms and headed for the country where he knew of a pond full of clean water and healthy fish."

(Tony grabs his pole and walks out the door into the hall, and waits. The narrator chooses three students to be fish, brings them up front, puts "fish eyes" on them, and has them lie down on a large blue felt pond to act like fish.)

"After a long hike, Tony arrived at the pond". (Tony walks back in and goes over to pond). "There he saw the fish jumping high up out of the water, snapping up insects and diving back under with a ker-splooosh!" (Fish act out what is said) "Tony was so excited by this water ballet that his hands were shaking as he hurriedly tried to bait his hook. Just at that exact moment, on his cheek, Tony felt a drop of rain." (Tony feels his cheek as narrator snaps fingers). "Then another...followed by another and another and another...and another...." (Have kids snap their fingers, then slap their thighs to simulate a downpour).

Tony was soaked to the skin."

Tony: "Aw man, I can't catch fish now. I'm so wet I'm liable to grow gills and turn into one."

Nar: "As Tony was preparing to leave, he noticed that something was wrong with the fish."

(Tony and narrator give the fish a long exaggerated look)

"They began to quiver slightly..."

(Give fish another look as fish act out)

"Then rapidly shake and finally they were all jerking about furiously gasping for air. Soon they were all floating bellies' up in the water -- dead."

Tony: TO BE AD LIBBED: Reacts in astonishment, deducts rain as the culprit, and collects rain sample in his bait can to have it analyzed by a scientist. Tony then rushes out the door into the hall.

(While Tony is waiting outside, narrator chooses a student to be the scientist, brings the student up front to put on a lab coat, and gives him/her a card to read).

Tony: Comes back in and acts as if he has walked a long way. He quickly explains to the scientist about the rain and dead fish, and asks the scientist if he/she could analyze the rain sample and tell him what is in it that is killing the fish.

Scientist: (READ FROM CARD) "This rain has a harmful acid in it which is formed when pollution from a coal-burning factory or power plant mixes with water vapor in the clouds."

Tony: "You mean this is acid rain? I've read about that! It's formed when pollution coming out of power plant smoke stacks mixes with the water in clouds. Then when this acid rains into ponds, it kills fish!"

"I must talk with the owner of the electric company about this."

(Tony walks out door again and narrator has scientist sit down and brings up another student to be the electric company owner. He is given a hard hat to wear, a card to read, and stands beside a cardboard picture of an electric generating plant).

Tony: (Walks back in, and goes over to owner.) "Your power plant pollutes the air which turns into acid rain which kills fish! I want you to tell me what you plan to do about it!"

Owner: (READ FROM CARD) "The public needs electricity and I burn coal to make it for them. The smoke from burning the coal contains a lot of sulfur dioxide which is the stuff that mixes with water vapor to form acid rain. The coal has a lot of sulfur in it so it is not my fault. It's the coal company's fault for selling me high-sulfur coal."

Tony: (ADD LIBBS that he needs to go to the coal company to find out why they sell high-sulfur coal. He trudges out the door again while the narrator has owner sit down, and brings up another student to be the coal company owner. She gets a miner's hat, a card to read, and stands beside a cardboard picture of a mine.

Tony: (Walks back in, looks exhausted, goes over to the coal owner and quickly relates his story:) "I was fishing, and it started to rain, and the fish died. I took a sample to a scientist who told me it was acid rain from power plants. I went to the electric company who told me that it was your fault because you sell him high-sulfur coal. I want you to tell me what you plan to do about it!"

Miner: (READ FROM CARD) "All the coal in this area of the country is high in sulfur. The electric company could buy low-sulfur coal from out west but it would put me out of work."

Tony: "I wouldn't want that to happen but something needs to be done about acid rain. Maybe the government can solve this problem."

(Tony goes out again. Narrator has coal owner sit down, and brings up a student to represent the government. This student puts on an Uncle Sam hat, and gets a card to read).

Tony: (Returns, goes over to government person, and reviews what he has been told thus far -- dead fish to scientist to electric company to coal company.) "I want to know what you plan to do about it!"

Govt: (READ FROM CARD) "This problem is very confusing and we need to know all about it before we act. We don't want to hurt anyone, you know."

Tony: "I know someone who would know all about it, Professor Finias J. Whoopee! He knows everything about everything."

(Tony walks out as narrator puts on a mortar board to become the professor.)

Tony: (Returns to Professor Whoopee, begins to explain problem, but is flustered, confused, too many parts to the puzzle, how do we solve acid rain, etc.; and asks the Professor for help.)

Whoopee: (Using cards, explain acid rain from start to finish; consumer demand for more electricity, mining of high sulfur coal, burning of coal as common but not only method of making electricity, release of sulfur dioxide into air mixing with water vapor to form acid rain, acidification of ponds and streams and releasing of toxic metals, death of fish and other aquatic life, other damaging effects of acid rain. Also mention automobile exhaust as another major cause of acid rain.)

Tony: "I now understand all the parts to this problem, but what can be done about it?"

Whoopee: "Well Tony, I happen to know of some people whom I'm sure can come up with an answer. They are a group of government advisors, and they just happen to be in this room!"

(Whoopee then turns to the students in the class and tells them that they have been turned into governmental advisors. Their job is going to be to develop a plan to give to the government so the government can decide what to do. They are then broken up into groups of 5-7 each, and instructed to brainstorm to come up with solutions to the acid rain problem. They will then write their proposal on newsprint, and then present it to the rest of the class. After presentations, go over the pros and cons of each proposal and mention any of the methods they missed; conservation, alternative energy sources, scrubbers, etc.)

Note: it will probably be necessary to review what brainstorming is, and that they write down their ideas on a piece of notebook paper before they come up with their final plan. It will also be necessary to circulate and help out the various groups while they are discussing and formulating the plans.

(End the discussion by saying:) "As advisors, you have done an excellent job. These are good plans, and hopefully this will help the government to make a decision on how to solve the acid rain problem." (The narrator then takes his place again on a chair up front, and picks up the large storybook to read:)

Nar: "Because of the efforts of people like Tony, something is being done about acid rain." (Tony acts proud) "However, the problem is far from being solved. For acid rain to become a problem of the past, its going to take even more effort from all of us. Then, maybe, we'll all live happily ever after."

THE END

MATERIALS FOR ACID RAIN PROGRAM

Fisherman's hat and fishing pole (for Tony)

Hard hat

Miner's hat (hard hat with a light on front)

Uncle Sam hat

Mortar board

(Note: these hats can be purchased inexpensively
from a costume shop)

White Lab coat

Large Book for Narrator (Mat board can be used for this)

Cardboard pictures (approx. 3' x 4'):
power and light company generating plant
coal mine

Large Blue Felt Lake (5' x 4')

3 pairs of "Fish Eyes" (Tennis balls cut in half and connected
with string, with elastic head strap)

3" x 5" index cards with scripts for student parts

12" x 18" Cards for professor Whoopie :

- appliances to represent consumer electricity demand
- a simplified diagram of coal burning, which heats water,
which turns to steam, which turns a generator, which
lights a lightbulb
- a large steam shovel in an open pit mine digging coal
- a factory belching black smoke, with drops of rain
falling out of the cloud, and a skull and crossbones in
the cloud -- to represent the formation of acid rain in
the clouds
- a lake being rained upon
- a dead fish

STUDENT ACID RAIN ACTIVITY SUGGESTIONS

Understand the pH scale; test familiar liquids to get a relative idea of what the numbers mean.

Collect water/snow samples locally and test them for pH.

Introduce the study of acid rain along with the study of aquatic food chains.

Have students put together a bulletin board that presents information about acid rain. Get a local newspaper or TV reporter to publicize your work and display. It's good, local news!

Visit a local utility plant and discuss acid rain control measures.

Make learning about acid rain fun; design a word find or crossword puzzle using terminology found in acid rain literature.

Have students learn about the different groups and views involved in acid rain issues; have students assume roles and act out dialogue - create a mock debate.

Have older students do research projects or design experiments geared toward the investigation of acid rain.

Take a field trip to see the effects of acid rain on monuments, tombstones, buildings, streams, lakes, that are apparent in your area.

Contact local environmental groups about their involvement in acid rain; have them lead a presentation or provide literature.

Explore buffering capacity in respect to rock and soil types; check the types in your area, along with other areas of a different type and draw comparisons, illustrate with classroom experiments or demonstrations if possible.

Explore the relationship between soil type and vegetation. Use buffered and non-buffered soils as test groups, and treat each type with two forms of water supply: acid rain pH 4.0 & "balanced" rain pH 5.6. Although growth may be initially enhanced by acid rain pH, the long-term effects are seen as quite detrimental to plant life, demonstrating the potentially dangerous situation that acid rain poses to the environment.

If there is snow accumulation in your area, demonstrate the idea of "spring shock" by sampling snow at the surface and near the ground level. The acidity of the snow closer to the ground shows how great fluctuations of pH are achieved with melting.

Investigate the local weather patterns, and how acid rain is spread from one area to another; send off helium balloons with postcards attached for return, see the potential strength of the winds carrying materials through your return responses.

Contact your local TV station and encourage the broadcast of acid rain levels in your area. Visit the station to see how shows are produced and talk to the news meteorologist.

Simulate the effects of acid rain by collecting invertebrates and subjecting them to different pH environments, monitor these changes.

Have students write to their Senators and Representatives to find out their views on the issue.

If your state environmental agency has an acid rain testing site close to you, arrange an educational visit.