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AUTHOR	Sly, Carolie; Ruskey, Abby
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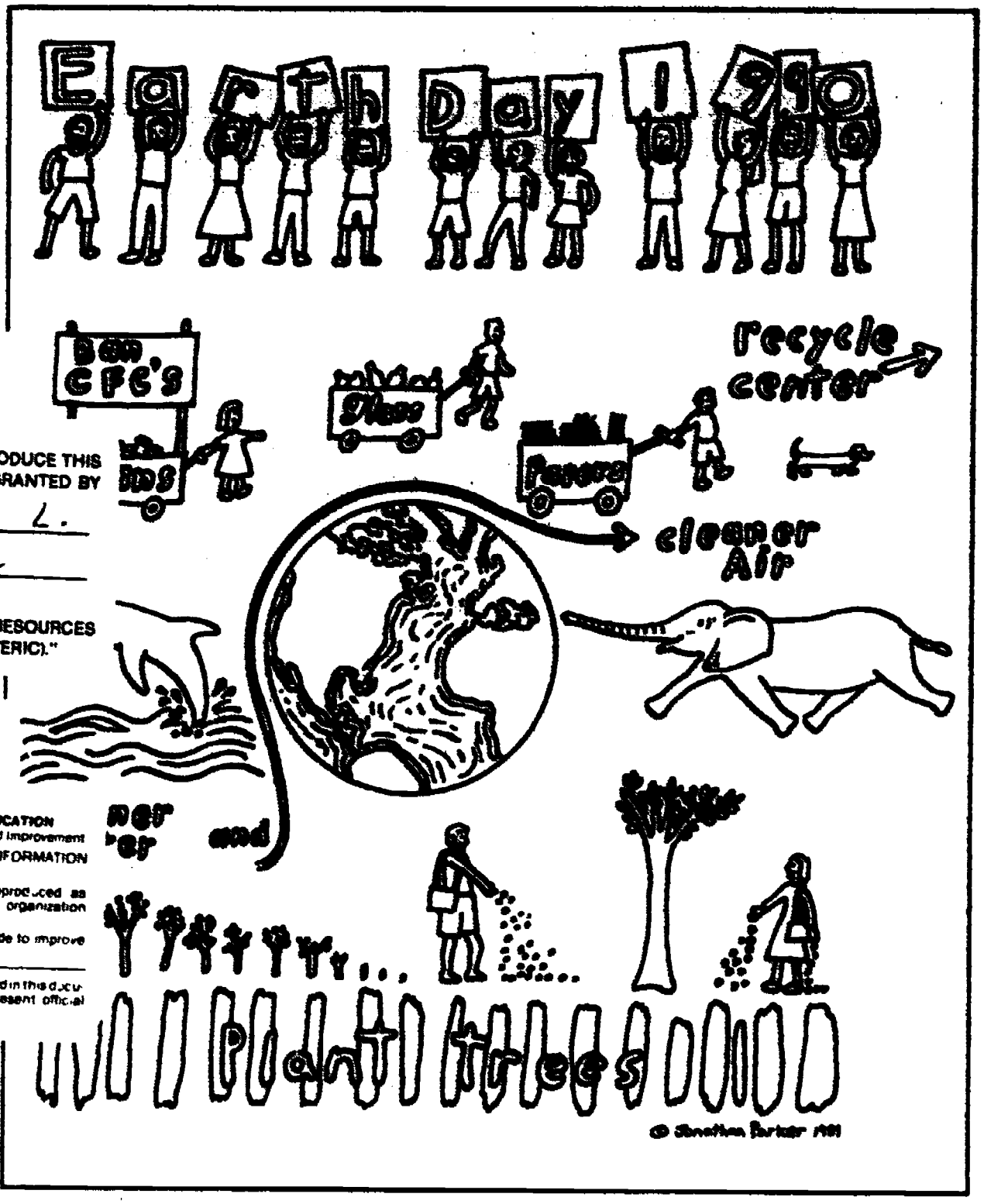
ABSTRACT

The purpose of this K-6 curriculum is to provide teachers and other educators with classroom lessons and home surveys that are a starting point for understanding four significant environmental issues--water, toxics, energy, and solid waste/recycling. While each of these environmental issues is complex and has far-reaching implications, the lessons and home surveys can serve as a way for teachers, students and families to begin thinking about these issues in relationship to their own lives. In this unit, students are introduced to each of the four issues in class and then take home a survey which they complete, if possible, with other family members. Each issue area involves two 45-minute lessons and a take-home survey. Students return to school with their completed surveys and discuss the results. In addition, a follow-up lesson for each issue is provided as a way for the teacher and students to take positive action in their own lives. This document contains the lesson plans, surveys, activity guide for making a poster, a resources guide, and a list of ideas for school projects. (CW)

LESSON PLAN AND HOME SURVEY–K-6



WITH FOLLOW-UP ACTIVITIES & HOME ACTION GUIDE

CO-SPONSORED BY THE ROCKEFELLER FOUNDATION AND ESPRIT

LESSON PLAN AND HOME SURVEY—GRADES K-6

ENERGY, SOLID WASTE/RECYCLING, TOXICS AND WATER WITH FOLLOW-UP ACTIVITIES AND ACTION GUIDE

CAROLIE SLY, CURRICULUM DESIGNER
ABBY RUSKEY, COORDINATOR

ENDORSED BY:

The American Federation of Teachers

The National Education Association

National Association of State Boards of Education

EARTH DAY 1990
P.O. BOX AA
STANFORD UNIVERSITY, CA 94309

Earth Day 1990

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LESSON PLANS, HOME SURVEYS AND FOLLOW-UP ACTIVITIES–K-12

PROGRAM DEVELOPMENT

K-6 CURRICULUM DESIGNER

Carolie Sly, Science / Environmental Education Curriculum Designer, Alameda County Office of Education and Coordinator of the award winning *California State Environmental Education Guide*.

Leslie Comnes and Celia Cuomo co-wrote the *California State Environmental Education Guide* from which the K-6 curriculum is adapted. Leslie Comnes was the Principal Writer for *Toxics: Taking Charge* from which the toxics lesson plans were adapted.

7-12 LESSON PLAN WRITERS

Amy Holm-Schuett, Environmental Education Curriculum and Teacher Training Consultant, Orange County, CA

Greg Schuett, Environmental Education Curriculum and Teacher Training Consultant, Manager of Environmental Field Study Program, Orange County Office of Education

7-12 SURVEY WRITERS

Seth Zuckerman, Environmental and Natural Resource Consultant, Berkeley, CA

Kim Taylor, Environmental Consultant, Energy and Resources Group, U.C. Berkeley, Berkeley, CA

Mark Valentine, Director of Issues, Earth Day 1990

ACTION GUIDE

Peter Drekmeier, Issues Coordinator, Earth Day 1990

Mark Valentine, Director of Issues, Earth Day 1990

Diana Aldridge, Director of Communications, Earth Day 1990

EARTH DAY 1990 FACT SHEETS AND SCHOOL IDEAS SHEET

Peter Drekmeier, Issues Coordinator, Earth Day 1990

K-12 LESSON PLAN AND HOME SURVEY PUBLICITY AND OUTREACH

Diana Aldridge, Director of Communications, Earth Day 1990

ILLUSTRATIONS

All illustrations (except where noted) by Nancy Gorrell, Artist and Elementary School Teacher, Berkeley, CA

Additional illustrations: Hope Epstein, Artist and Elementary School Teacher, Oakland, CA

GRAPHIC DESIGN AND PRODUCTION

Kristin Prentice, Sphinx Graphics, Berkeley, CA

COVER ART

Original color drawing by Jonathon Parker, Artist, Berkeley, CA. Re-drafted in pen by Nancy Gorrell.

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Brian Hirsh, Development Coordinator, Innovative Community Enterprises, New York, NY

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Clare Hertel, Media Relations-Education Outreach, Shaklee Corporation, San Francisco, CA

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Earth Day 1990

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2/15/90

Dear Educator:

Twenty years ago, on the first Earth day, 20 million Americans turned out to demonstrate their concern for a better environment. Students and educators throughout the nation played a significant role in the success and effectiveness of the first Earth Day. Campuses and schools across the country orchestrated thousands of educational teach-ins and special classroom instruction.

In the ensuing twenty years, a number of the problems that fueled the original Earth Day have been addressed effectively. Following Earth Day, 1970, the Environmental Protection Agency was created and Congress passed the Clean Air and Water Acts. Environmental consciousness was raised nation-wide. And many of the participants who were children or youth then are working for the health of the planet today.

Despite the environmental progress that has been made, the past two decades have seen many of our environmental problems worsen, and our planet now faces a diverse array of new ills. On April 22, 1990, the 20th anniversary of the first Earth Day, 100 million people demanding action for our endangered earth are expected to participate in the United States and in more than 120 countries around the world. The primary objective of Earth Day 1990 has been to launch a decade for the environment through public education campaigns and events encouraging individuals to make a difference in their schools, homes, workplaces and communities.

To further our objective of individual responsibility and empowerment through education, Earth Day 1990 is pleased to present the attached Earth Day 1990 K-12 Lesson Plan and Home Survey exercises. This education project has been designed to help equip the next generation of the earth's caretakers with an awareness of how their daily actions, and those of their families, affect the health of the planet.

Thank you for your interest in the Earth Day 1990 curriculum. Your participation and that of K-12 educators across the nation will not only guarantee the success of this exercise, but is vital to our goals of greater environmental awareness and lasting change.

Sincerely,

Denis Hayes
Chair, Earth Day 1990

Chris Desser
Executive Director, Earth Day 1990

Abby Ruskey
K-12 Coordinator

INTRODUCTION

LESSON PLAN AND HOME SURVEY—GRADES K-6

Purpose of Curriculum

The purpose of the Earth Day K - 6 Curriculum is to provide teachers and other educators with classroom lessons and home surveys that are a starting point for understanding four significant environmental issues—water, toxics, energy, and solid waste/recycling. While each of these environmental issues are complex and have far-reaching implications, the lesson and home survey can serve as a way for teachers, students, and families to begin thinking about these issues in relationship to their own lives. Most important, the lessons are designed to give students a sense of their own power to bring about change.

Students are introduced to each of the four issues in class and then take home a survey which they complete, if possible, with other family members. They return to school with their completed surveys and discuss the results. In addition, a follow-up lesson for each issue is provided as a way for the teacher and students to take positive action in their own lives.

The curriculum is structured to give the teacher maximum ability to modify. Whether or not the teacher uses one or all of the lesson plans is contingent on their ability to fit the curriculum into their Spring teaching schedule. Each issue area involves two-45 minute lessons and a take home survey for the children. The optional follow-up activities that are provided will take another one or two 45 minute in-class periods. We hope that teachers will be able to teach all of the lesson plans before Earth Day, April 22. However, the lesson plans are not date dependent and can be taught anytime.

How the Curriculum is Organized

Lessons addressing the four environmental issues follow a consistent format. **Background Information** provides the teacher with an overview of each issue. Under **Preparation and Lead-Up**, the teacher can find information about setting up the lessons and compiling the results of the survey for class discussion. Illustrations show some ways that survey results can be organized for class discussion. Although there is not an idea for every survey question, the variety of graphs and charts shown are meant to be a catalyst for engaging students' in a variety of ways to visually represent ideas. The **Day One** lesson is an introduction to that particular environmental issues and to the home survey. The **Home Surveys** include a mix of types of questions designed to bring out the knowledge, opinions, beliefs, and personal values held by students and their family members. The **Day Two** lesson is a discussion of survey results. Discussion questions are included to help clarify, summarize, and extrapolate from the survey results.

The **Follow-Up Activities** for each issue area follow the same format as the lesson plans above. All teachers will also receive the Earth Day 1990 **Action Guide** which is a listing of simple tips to help the environment for parents and students to work on together in their homes. The Action Guide is designed to be an 11" X 17" poster that can be put up at school or in the home. Teachers can make enough copies of both halves (included in this booklet) for each student and either tape the posters together or have the students attach the two sides. Earth Day 1990 intends for students to take this guide home at the conclusion of their Earth Day 1990 lesson(s) and before Earth Day 1990 itself.

Special Considerations for Grades Kindergarten Through Three

Students in the primary grades can begin to build a fundamental understanding of environmental issues by focusing on a particular set of observable behaviors in their own lives. Therefore, we suggest that the teacher choose one of the issues addressed in this curriculum and make that the focus for students and their families. The teacher can review the survey and modify it according to students' previous knowledge and interest level so students are gathering information about items which make sense to them and which can be compiled into a graph or chart to be discussed in a meaningful way. Suggestions for compiling survey results (found under Preparation and Lead-up) give students a variety of concrete ways to organize information in order to draw comparisons and begin to see relationships between behaviors and consequences.

The Role of Parents/Guardians

The role of parents and other family members is critical to the success of the lessons. The teacher will have to judge the level of participation of students' parents and adjust the surveys accordingly. In addition, the teacher, the Parent Teacher Associa-

tion (PTA), or the principal might hold an orientation meeting for parents to provide them with an overview of the Earth Day curriculum.

A sample letter to parents is included to help the teacher communicate the purposes and procedures of the home surveys. The teacher should add detail describing the particular survey the parent will be asked to participate in.

[redacted]

Dear Parent,

April 22 this year marks the 20th anniversary of Earth Day. The first Earth Day in 1970 resulted in many positive changes for the environment such as the creation of the Environmental Protection Agency, the Clean Air and Water Acts and generally, heightened public awareness of the environment. Still, there are many environmental problems that threaten us today; toxic waste, groundwater contamination, global warming and species extinction, to name a few.

We are celebrating Earth Day in our class by learning about some ways that we can make the earth a healthier place to live. As a first step, the students will be surveying their families about one or more of the following issues: water, toxics, energy, recycling. We will use the results of the survey to discuss these issues further and to think of ways that we might contribute to solving these issues. Please help your child complete and return these surveys by _____.

Thank you for your help.

Community Outreach

To inform your local community about what your class is doing for Earth Day, teachers may want to notify local newspapers, post graphs and pictures in libraries, YMCA's, city hall or senior centers and/or create displays for your schools' science fair.

Learning More About the Environment

For teachers who are interested in pursing further lessons in environmental education, the Environmental Education Resource Guide included in this packet lists additional environmental education curriculum as well as multi-media and organizational resources.

The Earth Day curriculum for grades K-6 is adapted from the award winning *California State Environmental Education Guide* and its supplements. This curriculum is organized around environmental themes; each theme is addressed through a 2-4 week instructional unit. For teachers who are interested in providing more in-depth instruction about fundamental environmental concepts, the *California State Environmental Education Guide* and supplements are available from The Alameda County Office of Education, 313 West Winton Avenue, Hayward, California, 94544-1198.

Earth Day 1990

ENERGY LESSON PLAN—GRADES K-6

SUMMARY OF ACTIVITY:

Students survey and tally energy use at home, contribute their information to a class graph, and discuss the advantages and disadvantages of some common appliances.

Time: Two 30-45 minute periods, with time in between to complete survey and fill in graphs.

Setting: Classroom, home

Materials:

- Several small electric appliances such as toaster, hair dryer, electric knife sharpener, or electric clock.
- Home Energy Survey, one for each student.
- Butcher paper.
- Felt markers or crayons.

BACKGROUND INFORMATION:

Energy is the capacity to do work or the ability to make things move. Energy comes in several forms—sound, light, heat, active (kinetic energy), and stored (potential energy)—and can be converted from one form to another. When we speak of energy as a resource, we are usually talking about potential energy that can be converted to other, more useful types of energy like heat, light, motion, or sound. Examples of potential energy resources are food, water held behind a dam, coal, oil, and gasoline.

Energy is a vital part of our everyday lives. Food provides us with the energy to live and grow. We depend on electrical energy for our refrigerators and lights. Energy provides us with hot water in our homes. Our cars and buses require energy from gasoline. We depend on energy in various forms for everything we do.

As a nation we have become economically dependent on large amounts of energy. This dependence has caused problems like air pollution and acid rain (caused by burning fossil fuels like petroleum, oil, natural gas), the possibility of damaging oil spills (caused by drilling rigs or tankers), political and military tensions (caused by dependence on foreign oil), the dwindling supply of oil and other fossil fuels, and safety questions about nuclear power plants and the wastes produced there.

Because energy is a broad, complex, and controversial topic that affects the quality of our lives and the environment, it is important that it be addressed in the classroom.

The United States uses more energy per person than other countries. Americans use 12 percent more energy than Swedes, 48 percent more energy than Germans, 300 percent more energy than Japanese, and 760 percent more energy than Mexicans. Because of our energy use, the United States is one of the world's largest polluters.

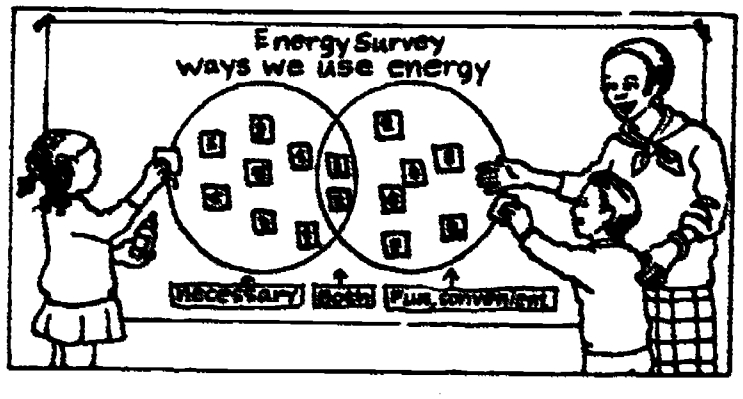
Using more energy-efficient equipment (cars, appliances, factory machines, and the like), eliminating unnecessary energy uses, and conserving energy could greatly reduce the United States' high per capita energy use. *Energy efficiency* is often called the cheapest source of new energy because implementing efficiency measures is much cheaper than building and installing any type of energy producer.

This activity focuses students' attention on the appliances they have at home. Students' survey results will indicate how many appliances students have but not which appliances use the most energy.

PREPARATION AND LEAD-UP:

For grades K-3: Prepare energy graphs on butcher paper like those illustrated. Students should be instructed to enter their data in these graphs on Day Two before your discussion of the results of the survey.

Prepare copies of the Home Energy Survey—Grades K-3, one per student.



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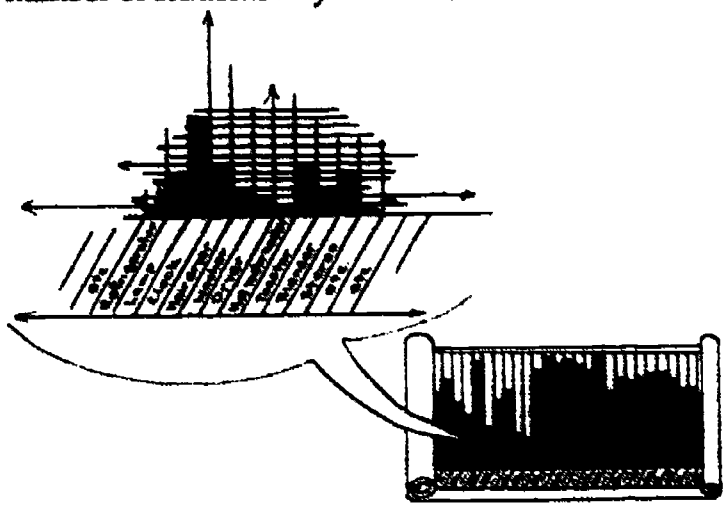
For grades 4-6: Draw a bar graph on butcher paper like the graph that is illustrated. The graph will need to be tall enough and wide enough to accommodate many kinds of appliances as well as a large number of each kind (think how many lamps you have in your home and multiply that number by the number of students in your class).



GRAPHIC: HOPE EPSTEIN

Prepare copies of the Home Energy Survey—4-6, one per student.

ACTIVITY FOR GRADES K-3:

Day One

1. Display a few common household appliances that use energy. Ask students to identify the appliances and discuss briefly what each is used for.

2. Give students a simple overview of what energy is by explaining that energy is what makes things work or move. There are different kinds of energy; some we can see, such as light, some we can feel, such as heat, and some we can hear, such as sound.

Food provides our bodies with the energy to grow, move around and keep warm. Another source of energy that many of us use is *electricity* which makes our lights, refrigerators, televisions, etc. work. Cars and buses need energy to run; they get energy from *gasoline*. Explain to students that Americans use more energy than any other country in the world. Energy is expensive and, in order to make some kinds of energy, other big problems, such as pollution and oil spills, can happen.

Ask students to name some appliances in their homes that use energy. Clarify between those that are human-powered and those that require another source of energy.

3. Take students outside (or clear a large space in the classroom) so students can act out various ways that we use energy. Some suggestions follow.

- a blender
- a washer
- a clothes dryer
- a garbage disposal
- a vacuum cleaner
- a car getting gas
- a person getting into a cold shower that gradually warms up
- a person using an electric saw to prune a tree
- a person using a power lawn mower

4. Once the group is settled down explain the Energy Home Survey to the class. Be sure they understand that they are to complete it with another family member, that they need to record all the ways they use energy within a 1 hour time period, and they are to return the survey the next day.

Day Two

Compile the results of the Energy Home Survey on the graphs (see Preparation and Lead-Up). The following discussion questions can be used to guide students' thinking as they discuss the results.

Discussion Questions:

What are some ways that most of us use energy in our homes?

What ways did you use energy that seemed necessary to carry out your life?

What ways did you use energy that were not necessary but for fun or convenience?

Do you think we use different kinds of energy at different times of the day?

Are there ways that you could use less energy at home?

Did you find out anything that surprised you?

ACTIVITY FOR GRADES 4-6:

Day One

1. Display a few common household appliances that use energy. Discuss the advantages and disadvan-

tages of each appliance.

2. Tell students that they will tally the kinds and number of energy-using appliances in their homes. Explain that students are to look for and record only those appliances that use energy, not appliances that are human-powered. Ask students to suggest some energy-using home appliances. If they do not name refrigerators and water heaters, mention them. These two appliances are big energy consumers in most homes.

Note: *Your heater, water heater and air conditioner are the largest users of energy in the home. Among appliances, refigerators account for 32.5%, washer and dryer accountt for 21.2%, lighting—18.2%, ranges—11.4%, miscellaneous items (such as hair dryers)—11.4%, and televisions—5.3% of home energy use.*

3. Hand out the Home Energy Survey and explain how you want students to record their information. Keeping a tally, as the example shows, is a convenient way for students to record their data. Have students estimate the total number of energy-using appliances they have at home and record this prediction on their Home Energy Surveys. Emphasize that you want students to survey each room in their house, if possible, in order to get the most accurate count.

Day Two

4. Post the bar graph and allow time for students to add their results (students may need to add data during recess or the lunch period in order to record it all). Make sure students understand that they are to record the kind and number of each appliance they found at home; for example, they should color in three squares in the TV column if they have three TV's in their house.

5. Discuss the information on the graph. Ask, "What is the most common appliance? Which appliances are least common? Which appliances do you think use the most energy? How can you tell?"

6. Choose an appliance from the graph and write it on the board. Ask students to think of an alternative that would use less energy. As a class, list the benefits and consequences of the appliance and the alternative. Repeat the exercise with one or more appliances.

Discussion Questions:

How accurate were your estimations about the number of energy-using appliances in your home?

Which of the appliances on the list do you really need?

Are there appliances on the list that you think you do not need?

Is there a difference between an energy "need" and an energy "convenience"?

Do we use more energy than we need?

How do we waste energy?

Why is energy conservation important?

How can we conserve energy?

What changes could you make in your home right now to conserve energy?

What do people usually consider when they make a choice about something that uses energy?

Resource:

The Energy Lesson Plan, Home Survey and Follow-Up Activity is adapted from the Energy unit in *The California State Environmental Education Guide*, (Sly, C.; Comnes, L.; Cuomo, C., 1988). This curriculum guide for grades K-6 is available from the Alameda County Office of Education, 313 W. Winton Avenue, Hayward, CA 94544-1198.

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ENERGY HOME SURVEY—GRADES K-3

Name: _____

Choose an hour block of time during which you and your child will record all the ways that you use energy Go about your normal activity but keep this survey sheet with you. Record every time you turn on a light, use an appliance, talk on the phone, etc. check those that were used during a one hour block of time.

The following list identifies some typical ways energy is used in the home. Use it as a starting point to keep track of your energy use. Add to the bottom of the list other ways you use energy. Put a check, or have your child check the appropriate time you completed this survey:

❑ morning ❑ afternoon ❑ night

Typical home energy uses:


lights _____


hot water _____


home heating _____

Appliances


television _____


radio _____

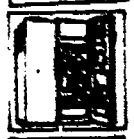

record player, stereo _____

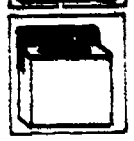

telephone _____


hair dryer _____


stove and/or oven _____


microwave _____


refrigerator _____


washer _____


dryer _____


toaster _____


blender, or food processor _____


garbage disposal _____


dishwasher _____


clock _____

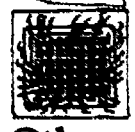

can opener _____


electric blanket _____


iron _____


typewriter, computer _____


vacuum cleaner _____


air conditioner _____

Other: Draw pictures on back.

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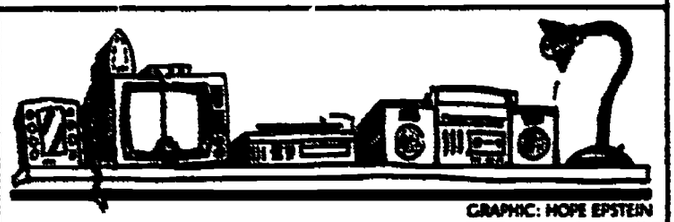
ENERGY HOME SURVEY—GRADES 4-6

HOME APPLIANCES

Name: _____ My estimate of the number of appliances in my home: _____

List all the appliances you have at home. Be sure to record the number of each kind that you find.

ELECTRIC CLOCKS IIII	
	 GRAPHIC: HOPE EPSTEIN

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ENERGY CONTRACTS

FOLLOW-UP ACTIVITY—GRADES K-6

SUMMARY OF ACTIVITY:

Students decide what actions they would be willing to take for one week to save energy, write a contract stating their intentions, then discuss the results after a week.

Time: Two 30-to 45-minute periods, one week apart.

Setting: Classroom, home

Materials:

- One piece of butcher paper.
- Writing paper.

BACKGROUND INFORMATION:

Americans use more energy per person than people in almost any other country, including countries with similar lifestyles. There are many ways we can conserve energy. Conservation can be as simple as acquiring the habit of turning off lights when we are not using them or as complex as developing cars that use renewable energy sources. Conservation can also mean changing behaviors; for instance, taking shorter showers or walking instead of driving for short trips.

This activity gives students the opportunity to decide how they can conserve energy. Obviously, the actions one individual student alone undertakes will not affect global or national energy consumption; however, the world is shaped as much by the seemingly minor actions of many people as it is by the significant actions of a few people. It is important for students to know they can make choices that make a difference.

PREPARATION AND LEAD-UP:

On butcher paper write an energy contract like the contract illustrated for step 3.

ACTIVITY:

1. Ask students to explain why we should care about conserving energy. If students have been discussing energy issues covered in the news, review articles that describe energy shortages, nonrenewable energy sources, energy costs, energy independence, and health problems associated with pollution and other effects of energy use.

2. Ask students to suggest ways they can save energy. Introduce a student to the notion of saving energy by making choices that save energy. Such choices might include taking shorter showers, washing hair in a sink instead of the shower, not leaving water running while washing dishes, defrosting the freezer, closing the refrigerator door as quickly as possible, and turning off lights, televisions, radios, and stereos when no one is in the room.

In order to conserve energy, I, Nicole Williams, will not use the electric can opener and I will turn off the lights when I'm the only one in the room. The same week I will not use my computer.
Signed,

Name: Nicole Williams
Date: Feb. 25, 1987
Parent's Signature:

3. Ask students to decide on one or more ways they will conserve energy for the next week. Post a sample energy contract stating their week-long commitment to conserve energy. Collect and save the contracts until the week is over.

4. Tell students that each night they are to write two or three sentences about how they are saving energy. During the week ask students periodically how they are doing and find out if they are running into any difficulty keeping their contracts.

5. At the end of the week, return the contracts to students. Ask students to re-read their original contract and then write a summary explaining whether they were able to keep to their plan, what difficulties they found, any unusual thing that happened, anything they learned about their habits and use of energy, and how they felt about making choices to conserve energy. Discuss the results (see the discussion questions).

Discussion Questions:

Were you able to follow through with your plan to conserve energy? Why or why not?

Was it easy or hard? Why?

What would make it easier for you to conserve energy?

What do you think might make it easier for other people to conserve energy?

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SOLID WASTE/RECYCLING LESSON PLAN—GRADES K-6

SUMMARY OF ACTIVITY:

Students survey themselves and their families to assess awareness levels and household practices related to recycling.

Time: Two 45 minute periods, with time in between to complete survey and fill in graphs.

Setting: Classroom, home

Materials:

- Examples of household garbage items.
- Butcher paper.
- Felt markers or crayons.
- Glue sticks.
- Home Recycling Survey.

BACKGROUND INFORMATION:

When we throw away garbage, it usually ends up in a landfill. Landfill space is getting increasingly scarce, and every time we throw something away we throw with it the energy, the money, the raw materials, and the water it took to make it.

The average American throws away 3.5 pounds of garbage per day. In 1990, it is estimated that Americans will throw away over 1 million tons of aluminum cans and foil, more than 11 million tons of glass bottles and jars, over 4 and a half million tons of office paper and nearly 10 million tons of newspaper. Almost all of this material could be recycled.

Recycling saves large amounts of energy. Recycling one glass jar saves enough energy to light a 100-watt light bulb for four hours. Recycling one soda can saves as much energy as if the can were half full of gasoline. Recycling an aluminum can results in *95% less air pollution and 97% less water pollution* than creating an aluminum can from raw materials. Manufacturing new paper products from waste paper uses at least a third less energy and cuts air pollution by 74 percent compared to making paper from wood pulp.

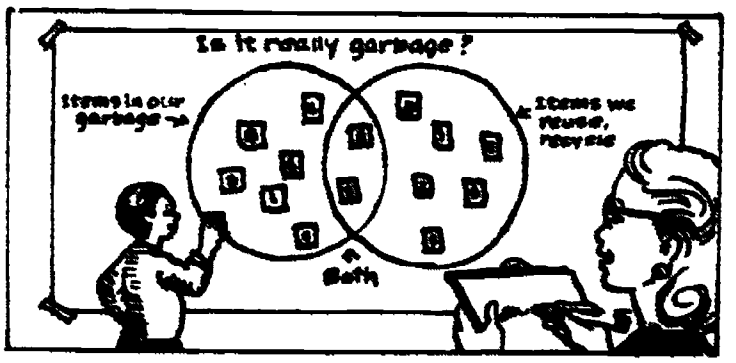
When waste products are recycled, fewer raw materials must be mined or logged. Americans threw away 35 billion aluminum cans last year—we threw away enough aluminum to build our entire air fleet four times over. Recycling paper reduces the pressure on our forests for wood pulp, so that less logging is necessary.

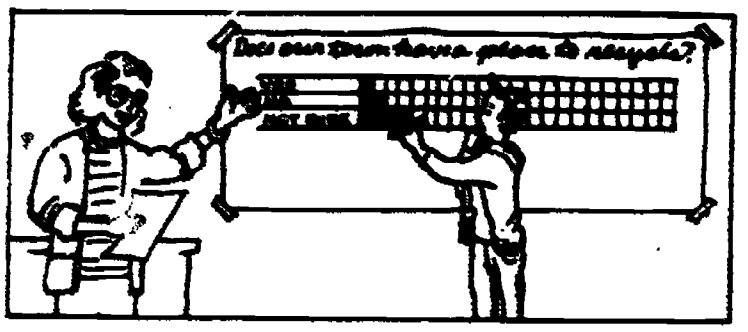
Of course, buying products that have less packaging reduces the amount of garbage going into the landfill in the first place. It is important to buy things that can be re-used or recycled. This is the concept of *precycling*.

PREPARATION AND LEAD-UP:

Collect a variety of household items that are thrown into the garbage, such as those things listed in question one of the Home Recycling Survey. Try to include items which could be used again, such as paper grocery bags and aluminum foil and things which create "instant" garbage such as disposable diapers and overpackaged products.

Prepare graphs like those below:





Prepare copies of the Home Recycling Survey, enough for one per household.

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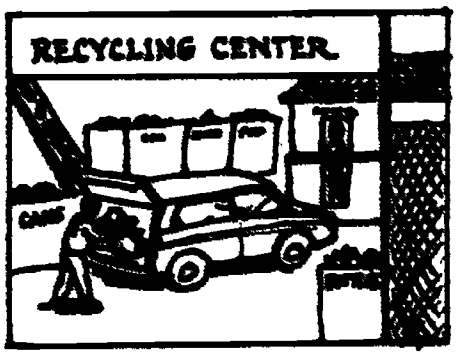
ACTIVITY FOR GRADES K-3:

Day One

Introduce the n. n of recycling by displaying a variety of household items which are frequently thrown into the garbage (see Preparation and Lead-Up). Ask students to describe uses for each of these household products. Tell students that each of the items can often be found in the garbage. Quickly survey the class by holding up each item and asking for a show of hands if the item could probably be found in their garbage at home.

Tell the class that, in order to reduce the amount of garbage we produce, some of the items could be used again and some could be used for other purposes, and some could be "replaced" at the store by purchasing other products in the first place.



Explain to the students that when we use an item more than one time (for the same or a different use) we call it *re-using*. *Recycling* is having an item *remade*. Recycling is good because the materials that come from the earth, such as trees that made paper, can be used again and again instead of cutting down more trees. And the original items will not pile up in the dump if they can be re-made (recycled). Ask students to brainstorm how a few of the items on display might be re-used and which ones can be recycled.

Tell students that they are going to take home a set of questions to be answered by them and at least one family member. Send home questions one through four or your own modification, based on student's abilities and community awareness of recycling.

Day Two

Set aside time for students to enter data on the graphs that you have prepared. Students should cut out the pictures from their surveys and put the ones with an "X" in the garbage circle and the ones without an "X" in the recycle circle. They can place items that can be recyled but get thrown away where the circles overlap.

Discussion Questions:

What items can be found in the garbage in *most* of our households?

Are any of the items used again (recycled) in *most* of our households? If so, what are they used for?

Does our town have a place where people can take items to be recycled?

If so, have any of you ever been there? What kinds of things did you take to be recycled?

Where do most of the people we surveyed think our garbage goes once it leaves our homes?

Why is it important to reduce the amount of garbage in our homes?

What are some ways that you might reduce the amount of garbage in your home?

ACTIVITY FOR GRADES 4-6:

Day One

Display the household items (see Preparation and Lead-Up) and ask students what characteristics the items have in common...and where the items might be found in their homes. Tell students that over the next two days they will be thinking about garbage and ways that people can reduce the amount of garbage they produce.

Ask students if any of the items could be used again, either in the same way they were used originally or in a different way. Introduce the term *recycling*.

Hand out the survey and explain that the survey is

not a test, and there are no right or wrong answers.

Divide the students into groups of four. Have each group discuss what their answers would be to the survey questions Then have them discuss the following questions:

- What three items on the list do you think are found in the garbage of most of your homes?
- Where do you think our garbage goes once it leaves our homes?

Have the group share their discussion with the class. Discuss with the students about why it is difficult for some people to recycle; their town may not have recycling facilities, their lifestyle is reliant upon disposable products, etc. Point out that everyone must define a starting point that makes sense for their lifestyles and begin there. They can gradually work on more ways to reduce the amount of garbage they produce.

Introduce the term *precycling* which means to reduce waste by not buying a product in the first place, buying an alternative product that produces less garbage or buying a product that can be recycled once it is used. Precycling involves selecting products carefully after considering the manner in which it is packaged, whether or not it can be reused or recycled, and its overall impact on the environment once it is discarded.

Day Two

Compile the data gathered from the survey and transfer it onto a chart for class discussion (see discussion questions).

Discussion Questions:

What did we find out from the results of this survey?

Does it appear that most of the people in our survey recycle some household items?

What ideas did the people surveyed have for *precycling*. (What alternative products did people list in question six?)

Why is it important to think about ways to reduce the amount of garbage we produce?

What might happen if we continue to use disposable products such as disposable diapers, razors, cups, etc.

What would it take to convince more people to recycle in our town?

Agree upon one way that everyone in your group could reduce the amount of garbage in his/her home. Make sure your choice is realistic for each group member (i.e., it is a product that every person now uses, it is re-useable, recyclable and/or replaceable with another product).

Resources:

Lesson Plan and **Home Survey** written by Carolie Sly, Alameda County Department of Education.

The Recycling Follow-Up Activity is adapted from the "Caring for the Environment" unit in the *The California State Environmental Education Guide*, (Sly, C.; Comnes, L.; Cuomo, C., 1988). This curriculum guide for grades K-6 is available from the Alameda County Office of Education, 313 W. Winton Avenue, Hayward, CA 94544-1198.

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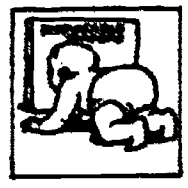
Earth Day 1990

HOME RECYCLING SURVEY—GRADES K-6

Name: _____

1. Put an X by the picture of those items that go into your garbage.

- ❑  cans (aluminum and/or tin)
- ❑  glass bottles
- ❑  paper
- ❑  aluminum foil
- ❑  styrofoam (containers and packing materials)
- ❑  cardboard
- ❑  disposable diapers
- ❑  plastic containers
- ❑  newspapers
- ❑  grocery bags (paper or plastic)
- ❑  egg cartons

2. Which items (of those listed above) could be recycled—by you or someone else?

_____

_____

_____

_____

3. Does your town or city have a place to recycle any of these items?

___Yes ___No ___I don't know

4. Where does your garbage go once it leaves your house? (Draw a picture or explain in words on the back of the page.)

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CONTINUATION PAGE—GRADES 4-6

5. a) Which items listed in question one could be saved and made into a new product?

5. b) If you are not sure, how might you find out?

6. What are the benefits and drawbacks of recycling to your family?

Benefits	Drawbacks

7. List five products that your family purchases which produce "instant garbage." They may come packaged in such a way that you throw away packaging as soon as you open them or they may be disposable so that you throw them away after using them only one time. Can you think of any alternatives to these products?

Instant Garbage	Possible Alternative

8. How does it help the environment to reuse things?

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Earth Day 1990

ECOLOGICAL PICNIC

RECYCLING FOLLOW-UP ACTIVITY—GRADES K-6

SUMMARY OF ACTIVITY:

Students plan and enjoy a picnic using a minimum of disposable items, then sort and recycle as much of the picnic garbage as possible.

Time: Varies, generally 30 minutes for planning, 60 minutes for the picnic, and 30 to 45 minutes after the picnic.

Setting: Classroom, outdoors

Materials:

- Typical lunch (see step 1).
- Two buckets or large cans for picnic garbage.
- One bucket with a tight-fitting cover for composting.
- Sawdust or dirt (optional; see step 8).

BACKGROUND INFORMATION:

People use disposable products for picnics and other occasions because there are no dirty dishes left over and no utensils that need to be taken home and washed. Just toss the products away and they seem to disappear. But there really is no "away"; all garbage must go somewhere. Any garbage that is not recycled contributes to the local landfill or becomes unsightly litter.

This activity reinforces the idea that students can make personal choices about their actions. In this case they will be making choices that will minimize the amount of waste generated by a class picnic. After the picnic students will collect the garbage that remains and recycle or compost what they can.

PREPARATION AND LEAD-UP:

Choose a site for the picnic (if you want students to help choose the site, see the extension ideas). Possible locations are the schoolyard, a vacant lot, a park, a playground, a ball field, a lawn, or the side steps to the school building.

If the weather is not suitable for an outdoor picnic, move it indoors. Push all of the desks aside and have the picnic in the middle of the classroom floor.

Label the buckets to be used for garbage during the picnic. The one with the cover should be labeled "Food." The other two buckets should be labeled "Cans" and "Other."

ACTIVITY:

Day One

1. Decide upon a typical lunch that students might bring to school. Ask students to decide what items from the lunch would be thrown away. Ask if any of the pieces of garbage could be reused or recycled. Have students think of something that is reusable that could replace each disposable item (for ex-

Dear Parents:

As the recycling activity for our lesson plan on Earth Day 1990, we are planning an ecological picnic on (date) at (time) to be held at (site). We have discussed ways to pack a lunch so that there will be as little garbage left over as possible (for example, using cloth napkins instead of paper napkins, bringing reusable silverware or reusable plastic silverware, putting food in reusable plastic containers when possible, bringing juice or milk in a thermos). Please help your child pack an ecological lunch for the picnic.

We will recycle as much leftover garbage as we can. Cans and aluminum foil will be recycled. Leftover food that can't be saved will be composted.

We will make a friendship salad the morning of the picnic. Students will contribute the fruit. We will wash the fruit and chop it at school, then enjoy it for dessert at the picnic. If you can contribute to the friendship salad, please send one or two pieces of fruit with your child on (date) along with his or her ecological lunch.

Also, we need two or three parent volunteers to help make the friendship salad and supervise the picnic. If you can join the fun and help out, please let me know.

Thank you.

ample, silverware could be used instead of plastic spoons and forks).

2. Plan the picnic. Ask students for ideas about how they can pack a lunch that will produce the least amount of garbage. Explain that they will be making a friendship salad the day of the picnic and that they can contribute one or two pieces of fruit if they want to.

3. Send the letter shown on the previous page to parents telling them of the picnic and asking for volunteers.

Day Two

4. On the morning of the picnic, discuss garbage and cleanup. Point out that some things will need to be thrown away even though the picnic was planned and choices were made so that there would be little garbage. Show students the buckets or cans you want them to use for all of the garbage at the picnic. Explain that one bucket is for recyclable containers, one is for leftover food that can't be saved, and one is for other garbage like paper and plastic. If there is water available at the picnic site, let students know that they can wash all dirty, reusable containers and utensils after the picnic.

5. One or more of the parent volunteers can help small groups of students wash and cut the fruit during the morning.

6. Remember to bring the three labeled buckets with you. Make sure students keep and sort their garbage after the picnic.

7. After lunch call the students together. Discuss what kinds of garbage are left over and what garbage isn't there because students made careful choices about what to bring. Make sure when the class leaves that no garbage is left at the picnic site.

After the Picnic

8. In the classroom put all of the food garbage from the picnic into the bucket for composting. You can layer the food with sawdust and dirt, if either is available. Make sure the cover fits tightly; open compost containers attract rodents and flies. Stir the mixture every three to five days for a couple of weeks. When most or all of it looks like dirt, use it. Add a little soil and plant flowers in it or mix it into the soil under a favorite tree. Let students know that compost is a kind of plant food; it contains many nutrients that plants use.

9. You or one of the parent volunteers can take the cans and bottles to the recycling center in your area. Discuss with the students where the cans and bottles are going and why it is better for the environment to recycle cans rather than throw them away.

10. Discuss with students what they did during the picnic that was good for the environment and good for people. Let students express their ideas and feelings. Discuss savings of paper (trees), plastic, and money.

11. Distribute paper and drawing materials and have students draw a picture of the picnic showing themselves and others doing something good for the environment. Older students can label their own pictures; younger students will need to dictate a sentence or two.

Discussion Questions:

What do you usually throw away after a picnic?

How could you pack a lunch for a picnic so you would have little or no garbage?

Why do you think people might want to use something that could be thrown away, even if they know it just makes more garbage?

Why is garbage bad for people, plants, and animals?

What kind of garbage was left over after the picnic?

What other kinds of garbage might we have had if we didn't plan an ecological picnic?

What choices did you and other class members make that were good for the environment? Good for people?

How can we turn a banana peel into a football? (Feed it to a pig.)

How can we turn an orange peel into a strawberry? (Compost it, then use the compost in a strawberry patch.)

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TOXICS LESSON PLAN—GRADES K-6

SUMMARY OF ACTIVITY:

Students survey themselves and their families to find out attitudes and beliefs about toxics.

Time: Two 45-minute periods, with time in between to complete survey.

Setting: Classroom, home

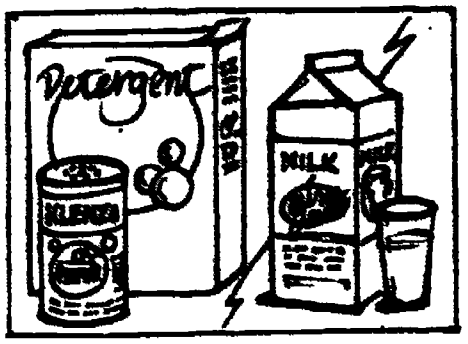
Materials:

- Four or five cleaning products that are potentially toxic (see Preparation and Lead-up).
- Several copies of Home Toxics Survey for each student (see Preparation and Lead-up).
- Butcher paper and marking pens.

BACKGROUND INFORMATION:

A toxic is any substance that is capable of harming a person if ingested, inhaled, or absorbed through any body surface. Toxic substances vary widely in the types of harm they cause and the conditions under which they become harmful. The effects of toxic substances vary widely, too. Acute reactions such as vomiting or dizziness as well as chronic reactions such as decline in mental alertness, changes in behavior, cancer, and mutations that can harm unborn children of exposed parents are possible. Because toxics can cause both acute and chronic reactions, they are a broader category than poisons, which produce acute reactions only. For this reason, the words *toxic* and *poison* are not interchangeable.

Nobody is "for" toxic chemicals in the sense of wanting to endanger ourselves and others, and yet many toxic substances seem to be a necessary part of our lives and have come to be considered essential in our homes, our workplaces, and our schools. This predicament or needing substances that sometimes produce undesirable side effects forces people to make choices about what is acceptable to them. Different people are willing to take different risks related to toxics and have varying concerns about the effects of toxics on themselves and people around them. Some people know that many of the products they use are potentially toxic but consider the risk worthwhile. Others try to avoid toxics and thus sacrifice the benefits of certain products.



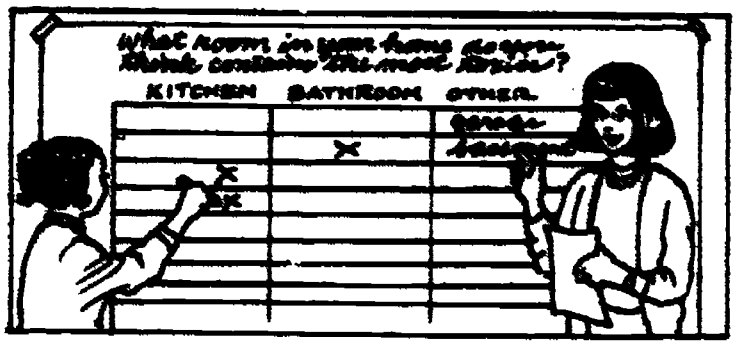
We do not know exactly how many households in our society use commercial cleaning products, but the number is quite high. In a survey conducted in the Seattle area, 97.5 percent of the respondents said they had household cleaners in their home. In a 1979 consumer survey of the most-used items sold in supermarkets, soaps and detergents topped the list, and other cleaning products such as scouring powders and air fresheners were bought by more people than staples such as milk and butter.

Many people do not know that household chemicals can be quite toxic. Most of the dangerous substances in the home are found in cleaners, solvents, pesticides, and products used for automotive care. In question number three of the copycat page, "Finding Out About Toxics," all of the items listed except salt and baking soda are toxic.

In this activity students survey themselves and their families to find out attitudes and beliefs people hold about toxics. Older students are also introduced to the terms *toxic*, *risk*, and *benefit* (a risk is a possible danger; a benefit is an advantage).

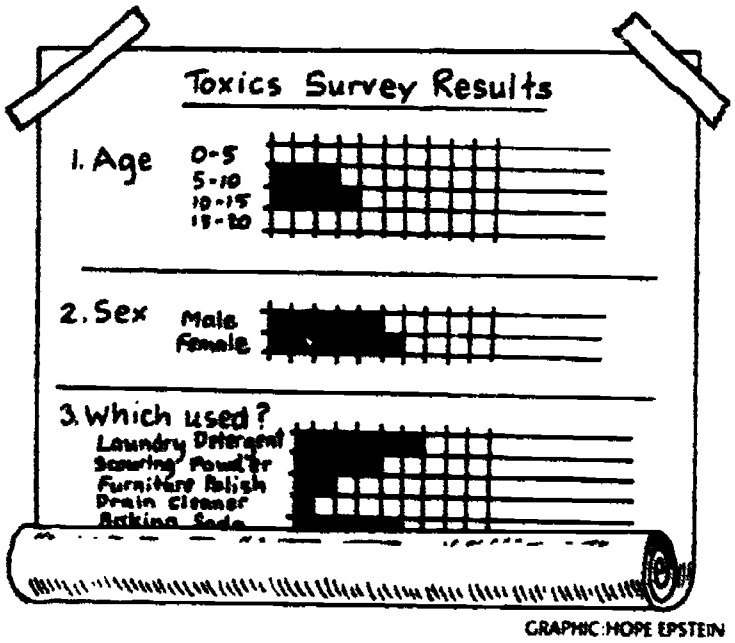
PREPARATION AND LEAD-UP:

For grades K-3: Prepare a butcher paper chart for the wall like that in the example shown on the top of the following page.



During the activity each student will answer the survey questions. Later, for a home learning activity, students interview family members. Make enough copies of the Home Toxics Survey so that each student can conduct the home surveys.

For grades 4-6: Collect four or five familiar cleaning products. Tape the lids on so that students cannot open the containers. Prepare a chart on butcher paper titled "Toxics Survey Results" that students can use to record the results of their surveys. The chart should list all of the survey questions and allow space for recording the responses.



GRAPHIC: HOPE EPSTEIN

Prepare copies of the Home Toxics Survey, one per household.

ACTIVITY FOR GRADES K-3:

Day One

1. Introduce students to the Home Survey by posing survey questions 1-6 to the class and listening to their responses. Based on their responses, modify the survey so students are gathering responses to only those questions which they seemed to understand. Explain that a survey is a set of questions with no right or wrong answers; surveys allow us to find out what different people think about the same questions.

2. Tell the class that they will be taking home the same set of questions that they have just answered in class. Tell them that they should ask each member of their family to record their individual responses on a separate sheet and share their responses verbally with the child. Ask the students to bring the surveys back to school the following day.

Day Two

Compile the results of the survey for discussion (see discussion questions) by using the graphing suggestions under Preparation and Lead-Up.

Discussion Questions:

What does "toxic" seem to mean to the people we surveyed?

All of the items in question number three except salt and baking soda contain toxic ingredients. Did the people we surveyed know this?

Do most people seem to agree about when it is okay to use toxics? If not, why do you think people have different ideas about this?

Did members of your family answer the questions the same way as you and as each other?

What else did we find out?

Was there anything that surprised you?

ACTIVITY FOR GRADES 4-6:

Day One

1. Introduce the activity and the unit by displaying the household products you have gathered. Ask students, "What are these things? What are they used for? What do we know about them? Is there anything dangerous about using them? What don't we know about these things that might be important to know?" Tell students that over the next two days they are going to be learning about some of the possible dangers of things that are called toxics. Say, "In order to find out more about what we as a class think about toxics, we are going to take a survey."

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2. Hand out one Home Toxics Survey to each student and explain that the survey is not a test, students do not need to write their name on the survey, and there are no right or wrong answers. Give students a few minutes to complete the survey.

3. Divide students into groups of four. Have each group discuss the following questions using the survey:

- What are toxics?
- Where do we find toxics?
- Who uses toxics? Why?
- Are we always aware of the presence of toxics?

4. Have groups share with the class their responses to these questions. Accept all responses; do not provide answers at this point. This is a time for students to begin thinking about toxics and for you to assess their initial understanding and attitudes. Talk with students about the idea that nobody is "for" toxics but that most people think these substances are a necessary part of their lives. Tell them that some people know many of the products they use are toxic yet consider it beneficial to continue using them, while other people try to avoid toxics by using an alternative or doing without certain products altogether.

5. Introduce the words *risk* and *benefit*. Help students discuss the meaning of these words.

6. Tell students that people's knowledge of toxics differs, as do their opinions, and that over the next two days the students are going to learn more about toxics. They will interview their family to find out what they know and think about toxics.

7. Hand out the survey forms for students to gather responses at home.

Day Two

8. Using the "Toxics Survey Results" chart you have prepared, compile results of the survey for discussion (see Discussion Questions).

Discussion Questions:

Are most people concerned or not concerned about toxics?

All of the items in question three, except salt and baking soda, contain toxic ingredients. How knowledgeable were the people we surveyed about this? Do their answers to this question agree or conflict with their answer to question six?

What does toxic mean?

What are the risks or benefits of using toxic substances?

What things did most of the people we surveyed agree on?

What else did we learn?

Was there anything that surprised you?

What do .s opinion mean?

What is the difference between fact and opinion?

What would you like to learn about toxics?

What choices can we make that are more beneficial to the environment and therefore to all of us?

Resource:

The Toxics Lesson Plan, Home Survey and Follow-Up Activity is adapted from *Toxics: Taking Charge*. (Comnes, L; Sly, C., 1989.) This instructional unit for grades 4-6 is available from the Alameda County Office of Education, 313 W. Winton Avenue, Hayward, CA 94544-1198.

Earth Day 1990

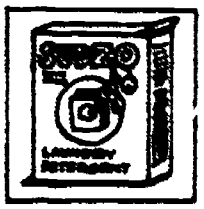
HOME TOXICS SURVEY—GRADES K-6

Name: _____

1. What is your age?_____ Are you male or female?_____

2. What do you think of when you hear the word toxic? (See the explanation at the bottom of page if you are unsure of what the word "toxic" means.)*

3. Which of the following do you use? Which of the following do you consider toxic?*



The *laundry detergent* your parents use to wash clothes.

_____ Use _____ Consider Toxic

The *baking soda* your parents use in cooking.

_____ Use _____ Consider Toxic

The *cleanser* your parents use to clean the sink and bathtub.

_____ Use _____ Consider Toxic

The *air freshener* your parents use to make the air in your house smell fresh.

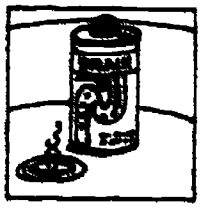
_____ Use _____ Consider Toxic

The *furniture polish* your parents use to clean and shine furniture.

_____ Use _____ Consider Toxic

The *ant spray* your parents use to kill ants in and around the house.

_____ Use _____ Consider Toxic

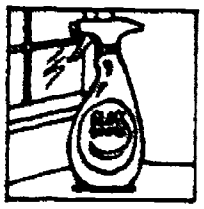


The *drain cleaner* your parents pour into sink and bathtub drains.

_____ Use _____ Consider Toxic

The *hair spray* some family members use to keep their hair in place.

_____ Use _____ Consider Toxic



The *glass cleaner* your parents use to clean windows and mirrors.

_____ Use _____ Consider Toxic

The *salt* you use to flavor food.

_____ Use _____ Consider Toxic

4. When do you think it is okay to use something that is toxic?

5. What room in your home do you think contains the most toxics?

*A toxic is any substance that is capable of harming a person if ingested, inhaled, or absorbed through any body surface.

CONTINUATION PAGE—GRADES 4-6

6. Which statement best describes your home?

_____ There are no toxics in my home.

_____ There are some toxics in my home.

_____ I do not know if there are toxics in my home.

7. Would you want to be told if something you are about to buy might be toxic?

_____ Yes

_____ No

_____ Sometimes

For Adults

8. Do you think that people who work where there are toxics should be told this when they are hired?

_____ Yes

_____ No

_____ Sometimes

9. Do you think individuals should decide whether to buy and use toxics, or do you think the government should make it illegal to sell toxics?

_____ Individuals should decide.

_____ Government should make it illegal.

_____ I don't know.

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Earth Day 1990

WHAT ARE THE ALTERNATIVES? AND SELLING A SAFER ALTERNATIVE

TOXICS FOLLOW-UP ACTIVITY—GRADES 4-6

SUMMARY OF ACTIVITY:

Students assess positive and negative consequences of using a familiar product that is toxic. They will then test a safe alternative to a toxic cleaning product and invent an ad campaign to sell the safer alternative.

Time: Two 45-minute periods plus time between for research and analysis.

Setting: Classroom

Materials:

- Copycat page, one per group of four.
- "Hazards of Houshold Products" sheet.
- For glass cleaner of vinegar and water; one tablespoon of white vinegar, one quart water, container for mixing the solution, and one sponge and squeegee for each group of four students.
- Materials needed to test any other non-toxic cleaning alternative.
- Drawing paper and colored pens or crayons.

BACKGROUND INFORMATION:

A toxic is any substance that is capable of harming a person if it is ingested, inhaled, or absorbed through any body surface. Every chemical can be toxic if too much of it is present, however. For example, salt can be toxic if taken is such a large quantity (e.g.: many cupsful) that it is harmful. Many substances, such as oranges, are virtually nontoxic, while other substances, such as the botulinus toxin (causing botulism), are so poisonous that a single taste can be deadly.

To help clarify the term toxic for regulatory purposes, Congress defined toxic substances in the Toxic Substances Control Act (TSCA).

According to this act, a toxic substance is a chemical or mixture of chemicals whose manufacture, processing, distribution, use, or disposal may present an "unreasonable risk" to the health of a person and the environment.

Risk is measured in two ways: by the inherent toxicity of the chemical (for example, oranges versus botulinus) and by the amount of exposure. Determining the severity of risk means taking these two risk factors and balancing them against the potential benefit to society. In this way, decision makers determine whether the substance in question poses an unreasonable risk of injury. Obviously, the process is complicated, and the final assessment relies on a value judgment; what is considered a reasonable or unreasonable risk depends on who is making the assessment.

Most controversial issues are controversial because there is no easy answer. People have different ideas about what is right and wrong and what is good and bad. The more deeply people care about an issue for health, emotional, or monetary reasons, the more controversial the issue is likely to become. Toxic substances can be extremely controversial because they involve all three concerns—health, emotions, and financial investments.

PREPARATION AND LEAD-UP:

Make copies of "Hazards of Some Household Products" sheet and the copycat page (attached) for each student group.

ACTIVITY FOR GRADES K-3:

Refer to step two under "Activity for Grades 4-6." Have a discussion about the pluses and minuses of a certain toxic product. Then talk with the students about possible safe alternatives.

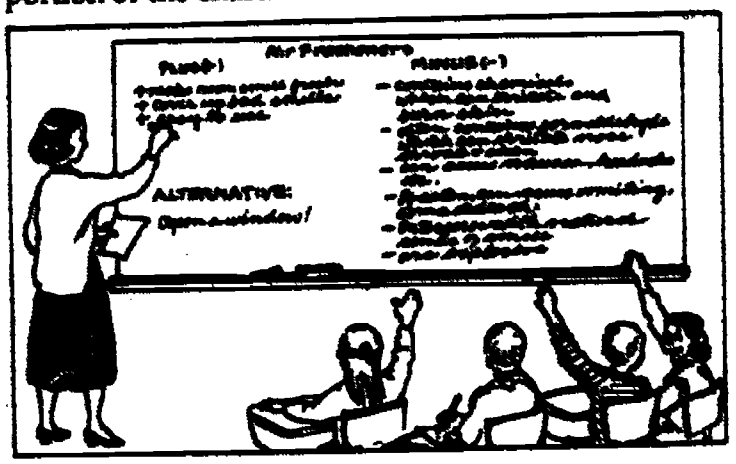
ACTIVITY FOR GRADES 4-6:

Day One

1. Ask students what the words *plus*, *minus*, *positive consequences*, and *negative consequences* mean. Tell them that in this activity they will look in-depth at a particular product to find out positive and negative consequences (pluses and minuses) of using the product. Students will then discuss nontoxic alternatives to the product and analyze the pluses and minuses of these. Finally, students will make a recommendation to the class about using the toxic

product.

2. To demonstrate, as a class go through the procedure using air fresheners as an example. Most air fresheners work by desensitizing your sense of smell a little, coating your nasal passage with an oily film, or masking the unpleasant odor with another odor. Students will probably now know some of the minuses of air fresheners; you can provide them with the information to fill in that portion of the chart.



3. Instruct students to divide into groups of four and to fill out the copycat page choosing one item from the "Hazards of Some Household Products" sheet. Tell students that each group will report to the class its recommendation, whether and how the toxic product should be used, and reasons for the recommendation. Remind students that you expect all four members of each group to participate.

4. Have each group report to the class its recommendation for use of the product. Groups should then explain their reasoning.

Discussion Questions:

Were there things all members of your group did not agree on?

How did you come up with a recommendation that you all agreed on? Was it difficult to do?

How realistic do you think our recommendations concerning these products are? Why?

Day Two

1. Tell students that they are going to test a non-toxic alternative to a product. After testing the alternative, they will then invent an advertisement that will pursuade people to use the product.

2. Divide students into groups of four. Have them mix the ingredients of the safe window cleaning alternative and then test it on a window or formica table surface.

3. Ask students how well the alternative worked. What are the pluses and minuses of using the alternative? What might be selling points for the alternative?

4. Challenge each group of four students to invent an advertisement that would persuade people to use the alternative. Groups may want to develop a television advertisement that they act out or a magazine ad that they draw.

5. Have each group present its advertisement to the entire class. Afterward, help students talk about how well the advertisements worked and what tactics were used to persuade potential customers (see discussion questions).

Discussion Questions:

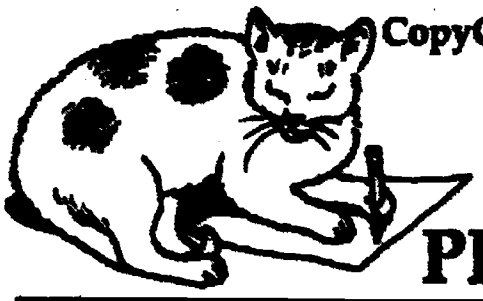
What tactics did you use to persuade your potential customers?

Did you exaggerate, or did you use only the facts?

Did you leave out any information?

Did you include any minuses in your ad? If not, why not?

Why do you think real life ad makers avoid the minuses?



CopyCat Page

Earth Day 1990

PRODUCTS: PRO'S AND CON'S

Names: _____

_____

_____

_____

Product: _____

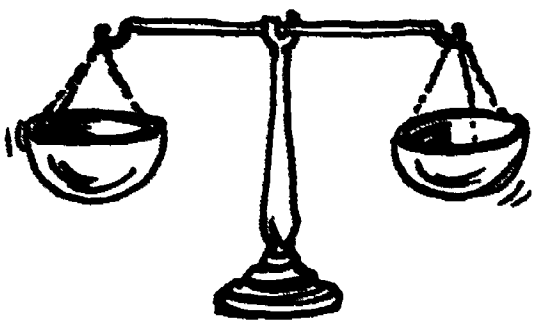
Plus (+) **Minus(-)**

Alternative: _____

Plus (+) **Minus(-)**

Alternative: _____

Plus (+) **Minus(-)**



Recommendation:

Hazards of Some Household Products

The following chart lists some household products that are potentially toxic, health effects that may result from exposure, and alternative actions that can reduce or eliminate exposure (excerpted from *Consumer Clean-Up Kit*. Sacramento, Calif.: California Department of Consumer Affairs, 1982).

HOUSEHOLD PRODUCTS

Product	Health Effects	What You Can Do
Aerosol spray products, including many kinds of health, beauty, and cleaning products	Aerosol products release particles in air that can be inhaled into your lungs, then absorbed into your bloodstream. These particles can give you headaches, nausea, shortness of breath, eye and throat irritations, skin rashes, burns, lung irritation, liver damage, heart problems, and possibly death. Aerosol products will explode if they are exposed to heat, causing burns and serious injury.	You can buy products in a nonaerosol form. Most products also come in creams, solids, liquids, and pump sprays. They will save you money, because aerosol products are expensive. If you do use aerosol products, do not inhale them. Make sure aerosol containers are not exposed to heat.
Air fresheners	Air fresheners contain chemicals that can irritate and burn your skin. They also interfere with your natural sense of smell.	Open a window to ventilate unpleasant odors. A dish of hot vinegar can remove room odors. Also, a bouquet of flowers can give your room a pleasant smell. Put a box of baking soda in the refrigerator to remove strong odors that start there.
Chlorine bleach	Chlorine bleaches can irritate and burn your skin and eyes. Even the fumes from chlorine bleach are irritating to your eyes and nose. *Never* mix chlorine bleach with ammonia, vinegar, toilet bowl cleaners, or other substances to make a strong cleaning solution; these mixtures produce dangerous gases that can be deadly.	If you use chlorine bleach, handle it carefully. Instead of using chlorine bleach as a cleaning agent, make your own cleaning solution by mixing baking soda in water.
Furniture and floor polish	These products contain chemicals, such as mineral spirits and petroleum distillates, that can irritate your skin, eyes, and nose. Some of these chemicals can cause photosensitization (sensitivity to light). These products are often flammable.	You can use soapy water to clean and a soft cloth to shine some items. You can make your own polish by mixing lemon juice and olive oil.
Hobby materials: clay and stone	If you inhale clay or rock dust, you can develop respiratory problems or lung cancer.	Kilns should be vented outdoors. You should wear a dust mask when grinding materials. Make sure you have good ventilation if you work indoors.
Hobby materials: glues and epoxy	These substances are flammable. They are skin and lung irritants and can make you more sensitive to a number of other substances. Some people have died after deliberately inhaling fumes from these products.	Read the product labels carefully. Wear gloves when you use these products and make sure you have good ventilation. Store these products away from heat and children.

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HOUSEHOLD PRODUCTS

Product	Health Effects	What You Can Do
Hobby materials: metal	Hobby activities that use metal materials often include dangerous chemicals. Many of these chemicals are eye, skin, and respiratory tract irritants. Some can cause poisoning.	Wear goggles and gloves. Use an exhaust fan while welding metals. Work only in a well-ventilated area.
Hobby materials: papier-mache	Some supplies used in papier-mache materials contain asbestos. If inhaled, asbestos can cause cancer.	Avoid using products that contain asbestos.
Hobby materials: photography supplies	Many of the chemicals used to develop photographs are dangerous. They are flammable and can cause skin, eye, and lung irritations. If swallowed, they cause poisoning. Many of these chemicals are acids, which can burn and blind you. Some of these chemicals cause cancer in laboratory animals.	Work with these materials only in a well-ventilated area. Wear goggles and gloves. Store these chemicals in unbreakable containers away from heat. Store acids in nonmetal containers. Never add water to acid to mix. Avoid products that contain benzene.
Nonphosphate detergents	These products are highly alkaline and can cause skin and eye irritations. They are dangerous if they are swallowed.	Use soap. If you use phosphate detergents instead, remember that they build up and pollute our water systems, because phosphates are not biodegradable.
Oven cleaners	Oven cleaners contain lye and other strong chemicals that can irritate and burn your skin and eyes.	Wipe your oven out after baking; this can reduce the need to use oven cleaners. You can clean your oven with a homemade solution of baking soda dissolved in water. Apply this solution to the oven, wait a few minutes, and then wipe off with a damp cloth.
Paints	Chemical components in paints can irritate your eyes, skin, and lungs. Inhaling paint fumes can give you headaches and nausea. Other chemicals in paints can cause respiratory problems, muscle weakness, and liver and kidney damage. Some paints are flammable.	If you can, paint items outside. When you paint indoors, make sure you have adequate ventilation. Using water-soluble paints can eliminate the need to use paint thinners, which contain additional toxic chemicals.
Rug and upholstery cleaners	These products contain some chemicals that, when inhaled, can cause nausea, anemia, liver damage, convulsions, and possibly coma.	Clean rugs and upholstery with a soap or nonaerosol shampoo. Wear gloves and make sure you have ventilation during the cleaning process.
Shoe polish	Some shoe polishes may contain nitrobenzene and other dangerous chemicals. Exposure to these chemicals can cause vomiting and shallow or other breathing problems. If you drink alcohol and are exposed to these chemicals, which are absorbed through skin contact, death can result.	Read the product label. Only buy shoe polish that lists the contents and don't use products that contain trichloroethylene, methylene chloride, or nitrobenzene. After polishing your shoes, make sure they are dry before wearing.
Spray fabric finishes	If you get these products in your eyes, the eye's natural tearing process cannot wash them out. This can cause severe eye damage.	Liquid fabric finishes are not nearly as convenient, but they are safer because they can be applied with a brush.

"Hazards of Some Household Products" Reprinted from *Toxics: Taking Charge* (Comnes, L., Sly, C., 1989).

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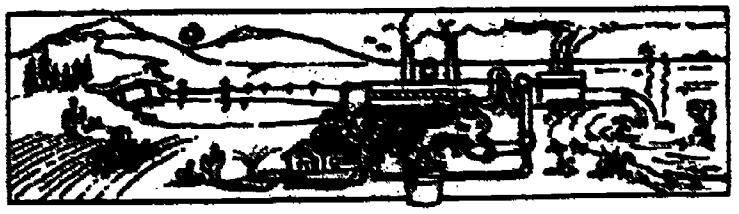
WATER LESSON PLAN—GRADES K-6



SUMMARY OF ACTIVITY:

Students survey themselves and their families to find out awareness levels, attitudes and beliefs about water.

Time: Two 45-minute activity periods, with time between to complete surveys and fill in graphs.

Setting: Classroom, home

Materials:

- Several copies of Home Water Survey for each student (see preparation).
- Half sheets of paper.

BACKGROUND INFORMATION:

Over 70% of the earth's surface is covered by water, most of it the salt water of the oceans. Fresh water, upon which we depend for drinking and agriculture accounts for only 3% of this total, and two thirds of that is frozen in the North and South Poles.

Fresh water is an important resource no matter where we live. Without enough clean, fresh water, the lives of every person, animal, and plant in the world would be in danger. For this reason, water, an element which is all around us, is a much fought over matter. The main issues surrounding water are quantity and quality.

Many of the problems relating to water use can be attributed to development in areas where there is an insufficient water supply. For example, although the southwest has only six percent of the country's fresh water, 31 percent of our water is used to meet the demands of heavy farming and urbanization in this area. As a result, increasing amounts of water are diverted from the Colorado River, and now only a limited amount of water-heavy with pesticides and fertilizers-reaches the sea.

Water diversion often leads to the destruction of wildlife. When rivers shrink, fish can no longer follow their normal paths of migration to spawn and may fail to reproduce. Diverting water also has a heavy impact on our diminishing wetlands, destroying animal habitat. In California, huge amounts of water are being diverted from Mono Lake's tributaries to be used in Los Angeles County. Mono Lake's water is naturally very salty, but as increased amounts of fresh water are diverted, the salt content has risen. Soon levels may be too high for brine shrimp to survive. If this happens, the food supply for the millions of birds that use Mono Lake as a stop over in their migration routes will be destroyed.

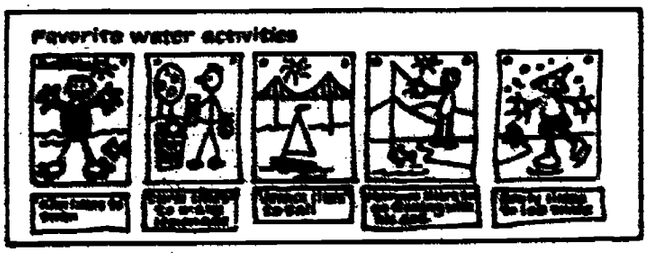
Much of the water we consume comes from underground reserves. If this water is used faster than it is replenished, it can cause land to sink, a process called subsidence. In Florida a few years ago, houses and cars were swallowed by sink holes. Once subsidence occurs, the underground aquifers where water was stored cannot be reformed. According to the U.S. Geological Survey, 35 states are pumping groundwater faster than it is being replenished.

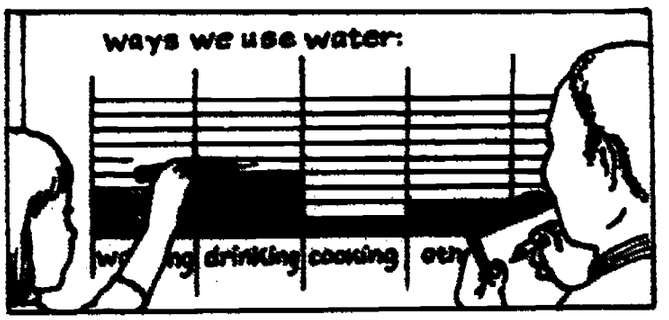
PREPARATION AND LEAD-UP:

Students will be conducting a survey of themselves and their families to find out what people believe about water and water rights. To introduce students

to how a survey works, take a quick survey of the class on a question like, "What is your favorite color?" Discuss with students what kinds of things they found out from this short survey. "What is the most common favorite color in our class? What is the least common? What else do we know about our group from this survey? (For students in fourth through sixth grades ask: What could we ask if we wanted to find out if people who have a particular favorite color have anything else in common?) Explain that a survey is a set of questions for which there are no right or wrong answers; surveys allow us to find out how different people think about the same topic.

For Students K-3: Look at the survey ahead of time and decide which questions you think your kids are able to answer. You may want to take an oral survey in class using questions 1-8 and modify accordingly. Prepare charts for compiling the results of the water similar to those in the examples below.





For Students 4-6: Prepare bar graphs like those below to compile the results of the Home Water Survey.

Prepare several copies of the Home Water Survey for each student.

ACTIVITY FOR GRADES K-3:

Day One

Introduce students to what a survey is (see Preparation and Lead-Up). Explain that each student will take home a survey that asks questions about water and that each family member should complete the survey in writing and share their responses with the student.

Day Two

Compile the results of the survey for discussion (see discussion questions) by using the graphs suggested under Preparation and Lead-up.

Plan the discussion for the afternoon and have the children fill in the bar graph over the course of the morning.

What are the most common uses for water among the people we surveyed? Did most people surveyed know where their water comes from?

Did the people in your family agree on who owns water? Did most of the people that we surveyed agree?

What do you think is the most interesting thing we found out?

What was the most surprising thing?

ACTIVITIES FOR GRADES 4-6:

Day One

1. The following guided imagery is designed to help students evaluate their feelings about a special place they care about enough to protect and to compare their feelings to those of others. It allows them to also think about the concept of ownership as it applies to water.

Students close their eyes and listen while you lead them through a guided imagery experience. In the guided imagery, each student thinks of a place special to him or her. If the special place contains water, then the student imagines the water taken away. If there is no water there, then the student imagines her or his place with lots of water.

When reading the following script, or your own variation, be sure to leave plenty of time for students to experience their images.

Guided Imagery Script for the Teacher

"Close your eyes and relax your entire body.... Take a slow, deep breath...now exhale with a slight sigh. Take another slow breath...and exhale. Now think of a place that is special to you.... It might be in your backyard or in your neighborhood, or a place you go on vacation every year.... It is a place where you can relax and think and where you enjoy

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being.... Think about the smells of that place...the sounds you hear...the things you see around you.... Pay attention to how you feel in your special place.... Notice what's around you...there may be trees, a lake or ocean, people, mountains.... Pay particular attention to whether or not there is any water in your special place.... Now imagine that your special place changes—if your place has water in it, imagine that all of a sudden the water is completely gone. If your special place has no water, imagine that it now has lots and lots of water.... Imagine what your special place is like now—what sounds do you hear?.... What do you see around you?.... Think about how your special place looks now and remember what you see and feel.... When you are ready, open your eyes.

2. After students have experienced the imagery, discuss the following questions.

What was your special place like with and without water?

How did you feel when your special place was changed?

Suppose you had the power to choose which way to keep your special place—either with water or without water. Which way would you choose? How might your decision affect others?

Do you think most people have a special place that they care about? How might this affect the decisions we make?

Who owns your special place?

Does ownership only mean "legal" ownership?

When we own something what responsibilities does that imply? What rights?

3. Explain to the class that they will be finding out how members of their families think and feel about some ideas related to water. Distribute the Water Home Survey and ask students to complete it and then take home enough copies for each member in their family. The survey should be returned the next day for compilation of data and class discussion.

Day Two

Compile the results of the survey on the chart (see Preparation and Lead-Up).

Discussion Questions:

What did we find out from our survey?

On which question do people seem to agree most? Disagree most?

Do you notice any differences between kids' and adults' opinions:

What is the most interesting thing we found out?

What was the most surprising thing? What happens when people don't agree about water issues?

Who do you think should have the right to make decisions about water?

Resources:

The **Water Lesson Plan and Home Survey** is adapted from an instructional unit on water being developed by The Alameda County Office of Education, 313 W. Winton Avenue, Hayward, CA 94544-1198. It will be available in summer, 1990.

The **Water Follow-Up Activity** is adapted from "Caring for the Environment" unit in *The California State Environmental Education Guide*, (Sly, C.; Comnes, L.; Cuomo, C, 1988). This curriculum guide for grades K-6 is available from the Alameda County Office of Education, 313 W. Winton Avenue, Hayward, CA 94554-1198.

Earth Day 1990

HOME WATER SURVEY—GRADES K-6

Name: _____

1 What is your age?

2. Are you male or female?

3. Name five ways that you use water every day.

_____

_____

_____

_____

_____

4. What is one of your favorite activities that involves water?

_____

_____

5. Where does your water come from?

_____

_____

_____

_____

6. a). Who do your think owns the water in a river or lake?

_____

b). In the ocean?

_____

_____

7. Since you and your family pay for the water you use, do you believe you own that water and can do anything you want with and to it? Why or why not?

_____

_____

8. Do you think people can hurt other living things by what they put in water?

___ yes

___ no

___ I don't know

CONTINUATION PAGE—GRADES 4-6

9. What do you think is the biggest problem concerning water in our community? (Check one)

___ A. Not enough water

___ B. Too much water

___ C. Water pollution

___ D. Water is wasted

___ E. Other problem

_____

___ F. There is no problem

10. On a scale of 1 to 5, how much of a problem would you say water quality is in our community? (Put an X on the line.)

not at all very much so

1 2 3 4 5

11. Suppose city planners believe that the population of your community will continue to grow, doubling in the next 20 years. The current water supply simply won't support that many people at the current levels of use. What do you think your community should do to prepare for this increase in water need?

___ A. Get more water by building a dam.

___ B. Get more water by buying water from another community.

___ C. Pass laws requiring people and businesses to use less water.

___ D. Get people to use less water by charging more for it, and save the extra money charged to pay for water later when the population increases.

___ E. Other.

_____

_____

_____

_____

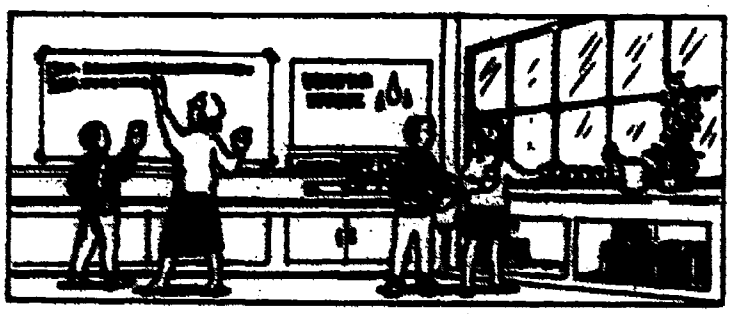
_____

_____

Earth Day 1990

CLASSROOM WATER CONSERVATION

WATER FOLLOW-UP ACTIVITY—GRADES K-6



SUMMARY OF ACTIVITY:

Students monitor classroom water use for a week, then take action to reduce the amount of water wasted and to reuse wasted water.

Time: One 30-minute period, then 15 minutes a day on four consecutive days.

Setting: Classroom

Materials:

- Dishpan.
- 75 paper party cups, eight ounces or larger.
- Butcher paper or poster-sized graph paper.
- Blue construction paper.

BACKGROUND INFORMATION:

By installing a few simple water-saving devices, costing less than $50, the average household can save more than 30,000 gallons of water and over $60 in water and energy costs each year. If every American made this investment as an Earth Day project, together we would save enough water to cover a football field 1,500 miles high, energy equivalent to 7 huge power plants, and over $1.3 billion per year."

—Amory Lovins, Director of Research, Rocky Montain Institute

The United States uses two to four times as much water per person as the countries of Europe. Fortunately, there are a number of water-saving appliances available at your local hardware store that save water without causing inconvenience. The bathroom is a good place to start with water conservation since this is where 70 percent of indoor household water is used.

This activity emphasizes awareness of water waste and teaches students that they can make choices about their actions. For example, they can choose not to let the water run or choose to reuse wasted water.

To capture water that would normally go down the classroom sink, you need a dishpan or bucket that will fit under the faucet in the sink but still allow access to the water. To measure the captured water, use paper party cups. After students have counted and graphed the day's catch, empty the cups and reuse them the next day.

PREPARATION AND LEAD-UP:

Make a graph on butcher paper similar to the graph pictured in the drawing. Keep some extra butcher paper handy so that you can add another piece if needed (you will probably be surprised at how much water is wasted).

Cut rectangles one inch by two inches from construction paper to represent cups of water on the graph. Call your local water department to find out the source or sources of local water. Call the local waste water treatment facility to find out how waste water is treated (see step 6).

ACTIVITY:

1. Discuss the importance of water for all living things (plants, fish, people, and other animals). Talk about how water is used, such as for drinking, for cleaning, and for transportation.

2. Remind students that one of the ways to help care for the environment is not to waste. Ask students to think about how they use water in the classroom. "Do you think you may be wasting water? What are some ways you use water that could be considered wasteful?" Tell students that they will keep track of how much water is wasted in the classroom.

3. Demonstrate the system for capturing water in the pan. Have several students show how to capture water while getting a drink or washing their hands. Explain that at the end of the day or whenever the pan is full, students will pour or scoop out the water into the plastic drinking cups. This way they see how many cups of water were wasted each day. You may want to have students estimate at the beginning of the day how many cups of water will be wasted.

4. At the end of the day or whenever the plan is full,

have several students help transfer water to the cups. Line up the cups so that everyone can see them and count how many there are. A student can graph the day's water use on the chart using the construction paper cups. (For example, if there are 60 cups at the end of the day, students need to put 60 pictures of cups on the graph.) Make sure the meaning of symbols on the graph is clear.

Note: *Unless they have had concrete graphing experiences already, many young students will have difficulty understanding the meaning of the graph. Each day emphasize that the construction paper cups on the graph represent the real cups of water.*

5. Ask students to think of ways to reduce water waste and to reuse the captured water (like watering indoor and outdoor plants, mixing up poster paints, or washing paint brushes). Emphasize to students that they should not drink the water or use it for any classroom pets (you may want to discuss possible health hazards of drinking waste water).

6. At some point during the week, let students know where their waste comes from and where waste water (from sinks, toilets, agricultural and industry use) goes.

7. As the week progresses and the class is wasting less water, point out to students that they are wasting less water because they are making choices about how to use water and are reusing water. Ask students how they think the environment benefits when they waste less water and when they reuse it.

Discussion Questions:

What are some of the ways we use water?

How do plants and other animals use water?

Could it be bad for the environment (plants, animals, rivers, and lakes) if we waste a lot of water?

How do we sometimes waste water in our classroom?

Did you make some choices that helped the class use less water?

Why did we use less or more water today?

Where does the water go when it goes down the drain?

Does it really go "away"?

Is water clean when it goes down the drain?

How might this dirty water harm the environment?

What do we use water for at home?

How is water sometimes wasted at home?

What could you do to waste less water at home?

ACTION GUIDE

ENERGY

DID YOU KNOW...?

As much energy leaks through American windows every year as flows through the Alaskan pipeline.

If every household in the United States used compact fluorescent light bulbs for their lighting needs, we could save the energy equivalent to that generated by 22 large nuclear plants.

WHAT YOU CAN DO

- Check with your utility company to request a free energy audit.
- Insulate and weatherstrip your home.
- Wrap your hot water heater in an insulation blanket.
- Replace your incandescent light bulbs with compact fluorescent bulbs that screw into standard sockets. They burn ten times as long and use only one quarter of the energy.
- When purchasing appliances buy the products that use the least energy.

EARTH DAY 1990
APRIL 22

WATER

DID YOU KNOW...?

Fresh water, upon which we depend for drinking and agriculture accounts for only 3% of the total amount of water on the planet. Three-fourths of this fresh water is frozen in the North and South Poles.

We could save over 250 million gallons of fresh water per day if every American home installed faucet aerators.

TRANSPORTATION

DID YOU KNOW...?

In one year, traffic congestion alone wasted about 3 billion gallons of gasoline—about 5% of the nation's annual gas consumption.

If every commuter car carried just one more passenger, we'd save 30-40 million gallons of gasoline and keep 12 million pounds of "greenhouse gases" out of the atmosphere every day.

WHAT YOU CAN DO

- Walk or ride your bike for short errands.
- Use public transportation or car pooling. Let someone else do the driving and take another car off the road.
- Choose an automobile that gets good gas mileage (at least 35 miles per gallon).
- Have your car smog checked and install pollution-control equipment if necessary.
- Keep your car tuned up and running well. A poorly tuned car wastes gas and creates added air pollution.

Solid Waste/ Recycling

Did you know...?

Americans, on average, generate three and a half pounds of garbage every day.

It takes more than 500,000 trees to produce the newspapers Americans read in one Sunday.

What You Can Do

- Separate your cans, bottles, plastic containers & bags, and newspapers and recycle them.
- Organize a recycling program at your school, office, apartment building, or place of worship.
- Use cloth napkins and towels instead of the paper variety; canvas grocery bags rather than the plastic and paper ones; permanent dishes and silverware instead of plastic, paper, and styrofoam replacements. Use cloth diapers instead of their plastic counterparts. Take your mug to school or work instead of buying a beverage in styrofoam.
- Encourage your school, office, or neighborhood group to use recycled paper for its stationary, photo-copier, and printing needs.

What You Can Do

- Install a low-flow showerhead. They won't affect your comfort level in the shower and you'll save money, energy, and water.
- Put a bottle of water in your toilet tank to cut down on water use per flush.
- Check water-lines, pipes, faucets and toilets for water leaks.
- Take shorter showers; try not to leave the water running while brushing your teeth, washing vegetables and rinsing dishes.
- When washing your car, use a bucket of water or a hose with an automatic shut-off nozzle instead of letting the hose run.

Toxics

Did you know...?

In 1983, 266 million tons of hazardous waste were generated–more than a ton for every person in the United States.

Americans throw away 25 billion styrofoam cups annually, enough to circle the Earth 436 times.

What You Can Do

- Check your supply of cleaning supplies to see which ones might contain toxic ingredients. Replace them with non-toxic alternatives such as baking soda, borax, natural soap, washing soda (sodium carbonate) and white vinegar.
- Think before you throw it away. Before disposing of a container, use up the entire product.
- Try to avoid unnecessary plastic products and containers.
- Do not drain automotive fluids into the sewer. Oil, antifreeze and batteries can be recycled at some gas stations and brake fluid and transmission fluid should be taken to a special hazardous waste disposal facility.
- If you are unable to completely use or recycle a hazardous product take it to a hazardous waste disposal facility.

ENVIRONMENTAL EDUCATION RESOURCE GUIDE

There are a number of environmental education resources available around the country and many right in town. We believe that the resources listed below are some of the best that are available and hope that you will be able to utilize them. Please let us know if there are any that we missed.

Local Sources

Some of the best resources for environmental education may exist right under your nose. Contact your county or State Department of Education, Resource Agencies, State Energy Office, or Environmental Protection Agency to find out if materials or programs are available. Some states—such as California, Wisconsin, Michigan, Washington, New York, and Florida—and many County Departments of Education have, or are developing, environmental education programs. Also, be sure to check into: **local museums or nature centers** to see if they sponsor any field trips or teacher trainings; **local zoos** which sometimes sponsor environmental education or wildlife habitat programs; **local, county, state and national parks** that sponsor nature walks and other programs and; **local environmental organizations** and centers that carry educational materials.

Organizations and Guides Offering Lesson Plans and School Activities

Alliance of Environmental Educators carry a variety of environmental education curricula. 2111 Wilson Blvd., Suite 701, Arlington, VA 22201.

American Nature Study Society promotes environmental education through "Nature Study" magazine, meetings, workshops, and field trips. 5881 Cold Brook Rd., Homer, NY 13077. Phone: (607) 749-3655.

Biological Science Curriculum Study (BSCS) variety of materials for teachers and students including textbooks, laboratory manuals, subject modules, and films. Contact BSCS, The Colorado College, Colorado Springs, CO 80903. Phone: (303) 473-2233.

Conservation and Renewable Energy Information Referral Service. Public inquiries and bibliographies on renewable and non-renewable energy. Phone: 1-(800) 523-2929.

Global Tomorrow Coalition carries environmental education curricula on tropical forests, marine and coastal pollution and other global issues. 1325 G-Street, N.W., Washington, DC 20005. Phone: (202) 628-4016.

Institute for Earth Education **"Earthkeepers"** an educational program for helping young people live in harmony with the earth and other resources. P. O. Box 288, Warrenville, IL 60555.

National Geographic Society two filmstrip sets about energy and pollution: "Challenges to a Healthy Environment" (Advanced) and "This World of Energy: II" (Intermediate and Advanced). Educational Services, Dept. 90, Washington, DC 20036.

National Audubon Society publishes newsletters, newspapers, and posters for a fee. New unit available on wetlands. Education Division, 950 Third Ave., NY, NY 10022. Phone: (212) 832-3200.

National Wildlife Federation nature education catalog lists science activity series, project kits, books, videos, etc. Attn: School Programs, 8925 Leesburg Pike, Vienna, VA 22184-0001.

Science and Environmental Education Resource Guide, 1989 directory of national science and environmental education resources. California State Department of Education, 721 Capital Mall, Sacramento, CA 95814.

Sierra Club provides free teachers newsletter, list of environmental education materials, filmstrips, slides and videos and a literature list for children. 703 Polk St., San Francisco, CA 94109 Phone: (415) 776-2211.

U.S. Environmental Protection Agency directory of environmental education materials for grades K-12. Office of Community and Intergovernmental Relations, Mail Code A-108 EA, U.S. Environmental Protection Agency, 401 M Street, SW, Washington, DC 20460. Phone: (202) 382-4454.

Zero Population Growth teacher training programs and K-12 curriculum. Population Growth Education Program, 1400 16th Street, NW, Suite 320, Washington, DC 20036. Phone: (202) 332-2200.

Lesson Plan and School Activities

A-Way with Waste curriculum guide about recycling for grades K-12. Washington Dept. of Ecology, 350 150th Ave., NE, Redmond, WA 98052.

California State Environmental Education Guide (1987) eight instructional units and six action projects (K-6). ($17.95) Alameda County Office of Education, Library Dept., EG, 313 W. Winton Avenue, Hayward, CA 94544-1198.

California Energy Extension Service—**Energy Action in Schools**—annotated bibliography of sample energy education materials, K-6 and 7-12. Governors Office of Planning and Research, 1400 10th Street, Room 209, Sacramento, CA 95814.

Green Box set of 178 activity cards for environmental educators (K-8). Cost is approx. $40. Contact Humboldt County Office of Education, Environmental Education Program, 901 Myrtle Avenue, Eureka, CA 95501. Phone: (707) 445-5411.

Living Lightly in the City (K-6). *Living Lightly on the Planet* (7-12). Schlitz Audubon Center, 1111 East Brown Deer Road, Milwaukee, WI 53217. Phone: (414) 352-2880.

Outdoor Biology Instructional Strategies (OBIS) set of activity cards for grades 4-9. Contact Delta Education, Inc., P.O. Box M, Nashua, NH 03061.

Project WILD wildlife education program for school teachers. Western Regional Environmental Education Council, Boulder, CO; Western Association of Fish and Wildlife Agencies (WAFWA); or your State Fish and Game Department.

Project Learning Tree (PLT) activity manual and teacher training workshops for environmental educators (K-12) focusing on plant life. American Forest Institute, 1619 Massachusetts Ave., NW, Washington, DC 20036.

Rainbow Child Programs K-6 earth awareness lesson plans and teacher training workshops. Rainbow Child Programs, 1705 Balsam Lane, Villanova, PA 19085. Phone: (215) 525-4133.

Sharing Nature with Children and *Listening to Nature* two books by Joseph Cornell Workshops. Ananda Publications, 14618 Tyler Foote Rd., Nevada City, CA 95959. Phone: (916)292-3225 or (800) 843-5272.

Toxics in My Home? You Bet! curriculum units on Household Hazardous waste, K-12 (also in Spanish) Golden Empire Health Planning Center, 2100 21st Street, Sacramento, CA 95818. Phone: (916) 731-5050.

Toxics: Taking Charge, a unit for grades 4-6. Supplement to the *California State Environmental Education Guide*. Alameda County Office of Education, 313 W. Winton Avenue, Hayward, CA 94554-1198.

Films, Videos and Plays

Bullfrog Films, Inc. rents films and videos with environmental themes. Bullfrog Films, Oley, PA 19547. Phone:(215) 779-8226.

Corporation for Public Broadcasting 1990—Year of the Environment- Environmental Resource Compendium, $10. PBS, Elementary and Secondary Service, 1320 Braddock Place, Alexandria, VA 22314 Phone: (202) 955-5110.

Earth Child a simple one act play / musical designed to be a center-piece for a 2-4 week mini-unit on the environment. K-12 Peace Child International, 3977 Chain Bridge Road, Fairfax, Virginia 22030. Phone: (703) 385-4494.

Facets—video distribution center which carries hard-to-find environmental education videos. 1517 W. fullerton Avenue, Chicago, IL 60614. Phone: 1-(800) 311-6197.

Film Distribution Center rents environmental films and videos. 13500 NE 124 Street, Suite 2, Kirkland, WA 98034-8010. Phone: (206) 820-2592.

The Lorax. Animated film about destruction of natural resources and pollution (also, see the Dr. Seuss book by this title-Random House, 1971). All ages. The Film and Video Library, University of Michigan, 400 Fourth St., Ann Arbor, MI 48103-4816, or Population Reference Bureau, Inc., 777 14th St., NW, Suite 800, Washington, DC 20005.

Media Network—environmental education films and videos. Also distributes *Greenjems*, guide listing available environmental films and videos. $6.50 individuals, $9.50 institutions. 121 Fulton, 5th Floor, New York, NY, 10038. Phone: (212) 619-3455.

Worldlink: Spaceship Earth: Our Global Environment. First in a series of video travels around the world to present segments on environmental problems and solutions. Hosted entirely by young people. Includes teacher guide. 8755 W. Colgate Avenue, Los Angeles, CA 90048. Phone: (213) 273-2636.

Electronic Bulletin Boards

National Geographic Kids Network. Grades 4-6. Contact Dorothy Perreca, Project Manager, Kids Network, Educational Media Division, National Geographic Society, Washington, DC 20036. Phone: (202) 775-6580.

Eco-net is an electronic network for environmental information. Write: Institute for Global Communication, 3228 Sacramento St., San Francisco, CA 94115. Phone: (415) 923-0900.

Earth Day 1990 School Ideas

Earth Day 1990, P.O. Box AA, Stanford, CA 94309
(415)321-1990

Lessons

- Use the Earth Day 1990 Lesson Plan and Home Survey in your class.
- Integrate environmental issues into all lessons.
- Organize an essay contest with an environmental theme, such as what the environment could be like on Earth Day 2000.
- Show movies about nature, such as National Geographic specials, "Never Cry Wolf" or "Call of the Wild." For other ideas contact: Bullfrog Films; 1-800-543-FROG.
- Read stories with environmental themes, such as The Lorax by Dr. Seuss.

Educating Others

- Organize a "pledge drive" to encourage people to sign the Earth Day 1990 Green Pledge. Challenge other classes and/or schools to see who can sign up the most people.
- Hold an environmental fair, with the proceeds going to creating a school environmental organization, setting up a recycling program or buying environmental books.
- Bring in speakers to talk about environmental issues.
- Have students write letters to elected officials asking them to support a specific local environmental project. Ask an elected official to come speak on the issue.
- Start an environmental club or newsletter for your school.
- Talk to your school's janitor or purchasing department about using non-toxic cleaners. Contact: Shaklee Corporation; 444 market St.; San Francisco, CA 94111; (415) 954-3000.

Schoolyard Activities

- Plant trees in the schoolyard. Contact: Global ReLeaf; P.O. Box 2000; Washington, DC 20013; (202) 667-3300.
- Grow trees from seeds. Contact: Trees For Life; 1103 Jefferson St.; Wichita, KS 67203; (316) 263-7294.
- Set up an organic garden at your school complete with a compost pile. Contact: The New Alchemy Institute; 237 Hatchville Rd.; East Falmouth, MA 02536; (508) 564-6301.
- Learn about how plants are the "producers" and "caretakers" of the environment. For a special kit from the California Association of Nurserymen, contact: Barbara David; Creative Consulting; P.O. Box 160602; Sacramento, CA 95816.
- Survey how many different kinds of plants, animals and insects live in your schoolyard and draw pictures of them.
- Build birdhouses and feeders for the schoolyard.
- Organize a cleanup of the schoolyard or a local park.

Recycling

- Organize a school recycling program with collection bins in the cafeteria and other areas where waste is generated. Contact: Audubon Adventures; Route 4; Sharon, CT 06069; (203) 364-0520.
- Set up a paper recycling area in your classroom. Paper with one good side can go into a box to be reused as scratch paper. Another box should be used for non-reusable white paper and a third box for colored paper.
- Have the students draw up and circulate a petition asking the administration to use recycled paper. For information on recycled paper, contact: Conservatree Paper Co.; 10 Lombard St., Suite 250; San Francisco, CA 94111; (415) 433-1000.
- Look through your classroom's garbage and discuss which materials are recyclable.

Energy and Water

- Have students use creative, non-polluting transportation methods to get to school during the week prior to Earth Day. Biking, roller skating, using a pogo-stick, riding a unicycle, piggy-backing, etc. Make it into a lunchtime parade with prizes for the most original.
- Organize a toy car or boat race operating on solar energy. Small photovoltaic cells are available for $5 apiece from Real Goods Trading Co.; 3041 Guidiville Rd.; Ukiah, CA 95482; (707) 468-9214.
- Build a solar box cooker and use it to have a cook-out. For design plans and recipes, send $5 to Solar Box Cookers International; 1724 Eleventh St.; Sacramento, CA 95814; (916) 444-6616.
- Put up stickers in your classroom to remind students to conserve energy.
- Have students help install water-saving devices in the school bathroom and then put up stickers to remind people to conserve water. Contact your local hardware store or water district about acquiring the right devices.
- Adopt a local stream and protect it from pollution and development. Contact: Save Our Streams; The Izaak Walton League of America; 1401 Wilson Blvd., Level B; Arlington, VA 22209; (703) 528-1818.

Arts and Crafts

- Organize an environmental picture contest dramatizing the best (beauty) and worst (pollution) of nature. Encourage local businesses to put up the pictures in their windows.
- Make a paper tree on the classroom wall with each leaf giving a tip on how to protect the environment.
- Have students perform a play or puppet show with an environmental theme.
- Make reusable canvas grocery bags as a craft project.
- Paint an Earth Ball and organize activities with it. An Earth Ball can be purchased from Passon's Sports for $398 plus shipping. Call 1-800-523-1557.
- Make nature cards to wish parents and friends a happy Earth Day. Nature print kits can be purchased for $11 from Solargraphics; P.O. Box 7091; Berkeley, CA 94707; (415) 548-5230.
- Sing songs about nature. An environmental songbook is available for $9.95 from the Citizens Clearinghouse for Hazardous Waste; P.O. Box 926; Arlington, VA 22216; (703) 276-7070.

Field Trips

- Visit a dump and a recycling center to learn about two different methods of waste management.
- Arrange for a tour of a wind farm, a geothermal power plant or a building that uses solar energy. All are non-polluting energy sources.
- Survey what kind of garbage washes up on a beach or lakeshore and organize a clean-up. Contact: Center for Marine Conservation; 1725 DeSales St., NW; Washington, DC 20036; (202) 429-5609.
- Visit a nature center, a natural history museum or a wilderness area.
- Take a trip to a local organic farm that uses sustainable methods to grow food.

Other Activities

- Purchase an environmental game for your classroom, such as "The Whale Game," available for $22.95 from Seventh Generation; 10 Farrell St.; S. Burlington, VT 05403; (802) 862-2999.
- Throw a birthday party for Mother Earth. Contact: Earth Birthday Project; 183 Pineherst #34; New York, NY 10033; (212) 928-1463.
- Make the connection between population growth and environmental problems. Using chalk, draw an outline map of the world on the playground and apportion students according to world population distribution. How many times can population double before there's no room left? For more ideas, contact: Zero Population Growth; 1400 16th St., NW, Suite 320; Washington, DC 20036; (202) 332-2200.
- Put up a picture of planet Earth in your classroom. Contact: World Federalist Association - United Nations Office; 777 United Nations Plaza; New York, NY 10017; (212) 599-1320.
- Organize a parade of students dressed as their favorite endangered species.
- Change your school mascot to an endangered species.

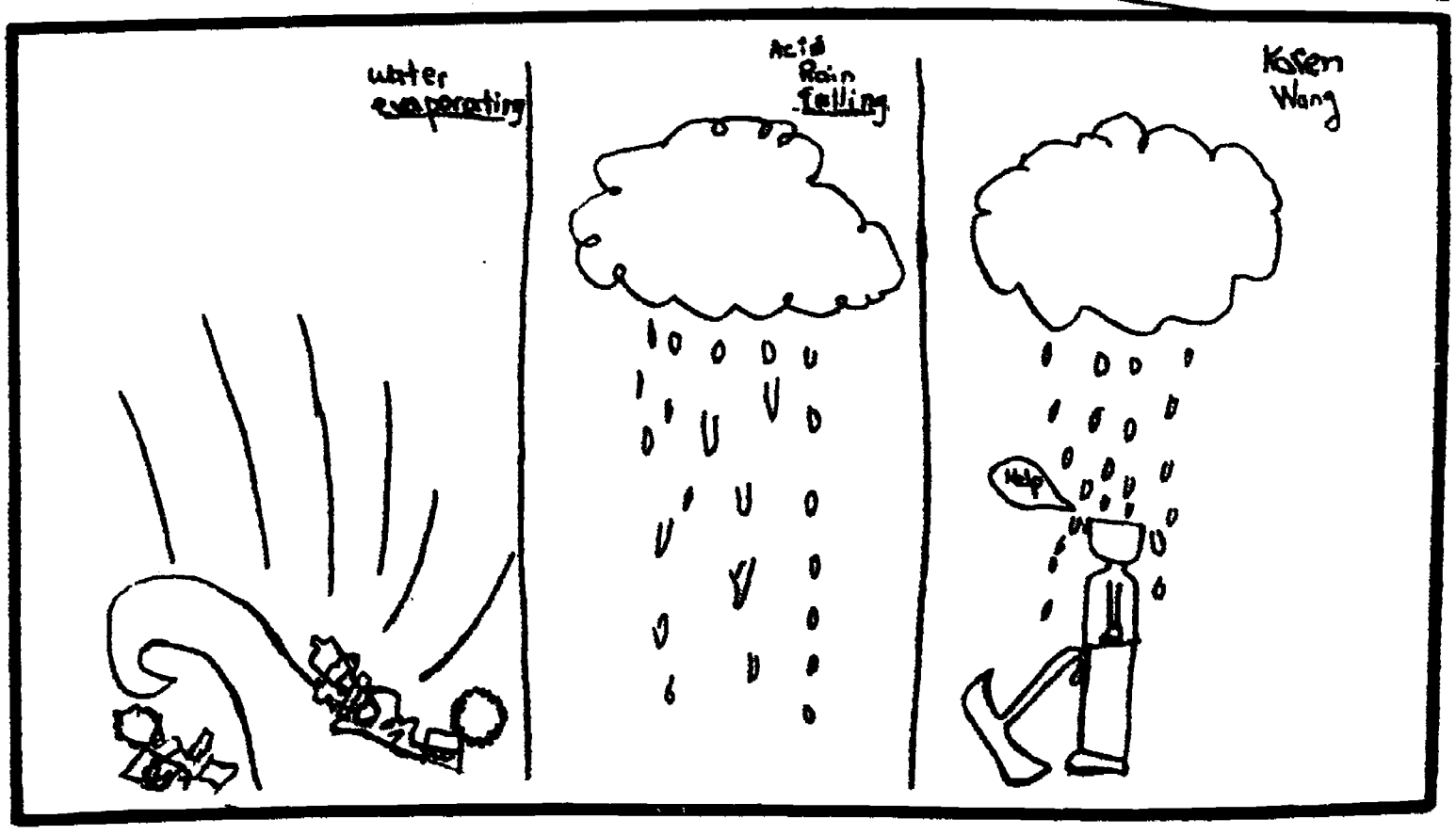
Wasting resources is bad for our country and our earth. When you carve a hole in a mountain to get metal it leaves a big old bald spot on the mountain. People waste papper. We don't waste papper because you have to cut down trees to get papper. Trees breathe. If they don't we don't.

by David Herrera

Recycling is a very good proiess because we don't have room for trash in the dumps. Everyday makes up 5lbs per person per day so I think we should all recycle and be good to Mother Nature

People waste water and that is something else bad. Some people brush their teeth and keep the water going even when they do not need the water. You should make the right choice and turn off the water when you brush your teeth.

By Emily Brumbaugh



Student selections from Laura Rodriguez's 4th grade students, David Weir Elementary School, Fairfeild, California. Reprinted from the *Ecology Center Newsletter*, Berkeley, CA.