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ABSTRACT

This manual presents a variety of ideas for environmental education projects that range in duration from two weeks to several years. All of the projects are designed to make learning interesting and relevant to the lives of students by enabling them to develop a sense of connection to their world and a framework that empowers them to make positive contributions to the environment. The manual outlines the projects depicted in the videotape and provides project contacts, state education contacts, fundraising ideas, curricula and other resources. Both the manual and the videotape are divided into three sections: On Campus, Off Campus, and Educating Others. Topics for projects include trash analysis, printing a newspaper, and making a documentary film. The procedure to use when performing environmental audits in school and business settings is explained. (DDR)

The *Generation Earth* Companion Manual

Your Guide To Environmental Education Replication

by Tyson Miller and Jeff Barrie

Includes:

How-to

Project Descriptions

Additional Resources

CONTACTS
for more help

Earth Endeavors
1996

Contents

"Environmental Education (EE) is a process aimed at developing a world population that is aware of and concerned about the total environment and its associated problems, and which has the knowledge, attitudes, motivations, commitments and skills to work individually and collectively toward solutions of current problems and the prevention of new ones."

Definition from the Unesco Conference in Tbilisi, Georgia, USSR in 1977

Introduction

This manual complements **Generation Earth**, the video. If you are an educator, student or anyone interested in EE, this will help you in replicating any of the projects you saw in our video. We have outlined the projects and provided you with useful information like project-by-project contacts, curricula and other resources, fundraising ideas and state-by-state education contacts. This will guide you on your way towards starting an EE activity in your own school or organization.

Generation Earth shows you a variety of ideas ranging from simple two week projects to ones designed to last for years. They all share the capacity to make learning interesting and relevant to the lives of students. EE provides students with a sense of connection to their world and a framework that empowers them to make positive contributions to our environment. As one student said, "We all live on one planet, we should have the knowledge that will help us protect it."

How to Use this Manual

Like the video, this manual is divided into three main sections: *On Campus*, *Off Campus* and *Educating Others*. Programs are listed in the order they appear in the video. Most of the descriptions are based on information provided by the teachers who started the programs. At the end of each one are contacts and resources. These resources can also be obtained through the lending library of the Center for Environmental Education (see page 34). Feel free to copy any of the information in this manual and pass it on to others. Remember, this guide is intended to help you get started. Your actual methods and subsequent results may vary. Use your imagination.

We have shown you a mere glimpse of the world of EE. Hopefully this introduction will inspire you to implement your own project or put new life into programs already in place.

Thank You! Feel free to call on us if you have any questions:

Earth Endeavors
P.O. Box 6130
Torrance, CA 90504
(310) 535-2419

Guiding Principles of Environmental Education from the Tbilisi Declaration, 1977*

Environmental education should...

- consider the environment in its totality--natural and built, technological and social (economic, political, cultural, historical, moral and aesthetic).
- be a continuous, lifelong process, beginning at the preschool level and continuing through all formal and non formal stages.
- be interdisciplinary in its approach, drawing on the specific content of each discipline in making possible a holistic and balanced perspective.
- examine major environmental issues from local, national, regional and international points of view so that students receive insights into environmental conditions in other geographic areas.
- focus on current and potential environmental situations while taking into account the historical perspective.
- promote the value and necessity of local, national, and international cooperation in the prevention and solution of environmental problems.
- explicitly consider environmental aspects in plans for development and growth.
- enable learners to have a role in planning their learning experiences and provide an opportunity for making decisions and accepting their consequences.
- relate environmental sensitivity, knowledge, problem-solving skills and values clarification to every age, but with special emphasis on environmental sensitivity to the learner's own community in early years.
- help learners discover the symptoms and the real causes of environmental problems.
- emphasize the complexity of environmental problems and thus the need to develop critical thinking and problem solving skills.
- utilize diverse learning environments and a broad array of approaches to teaching, learning about and from the environment, with due stress on practical activities and first-hand experience.

* *Unesco Conference in Tbilisi, Georgia, USSR in 1977*

I

On Campus

The School Environment

Auditing Your School

"Giving students a chance to make positive change for the school."

Understanding the concept of sustainability and how it can be achieved simply requires a look at our daily lives. Analyzing our consumption habits enables us to take the next step to change un-ecological decisions. A project of this type demands that students learn about and work towards sustainability by starting in their own backyard: the school environment. In this project students have investigated everything from energy consumption to chemical usage. They look at current practices and technologies, then research the alternatives and make recommendations to the school board for improving the campus environment.

Dan Sponaugle, the biology teacher at Mira Costa High School in California used the curriculum entitled **Environmental Action** which is available from the non-profit group *E2: Environment and Education* (see *resources*, pg. 6). This is a helpful resource, but with a little imagination you can make do without. Dan's audit lasted about 4 weeks, but a comprehensive program can last up to the entire school year. It depends upon your level of complexity and commitment.

Getting Started

- Have students form small groups which will each pick one subject area: food and nutrition, recycling, water, energy, gardens/landscaping or chemicals.
- Seek the help of groundskeepers, custodians and cafeteria workers. They are good people for students to interview.
- Students should do some preliminary library research to learn more about their subject areas in general (See *resources* , pg. 6 or contact The Center for Environmental Education for more help in these areas).
- Enlist the help of your campus ecology club in implementing changes students recommend as a result of their projects.

Time for Action

Note: The following suggestions are based on the actions of Mira Costa's students and can be used as a guide. Your own students' research, steps and recommendations will be unique.

Phase I: Do preliminary research of subjects and submit a proposal of procedures. Make sure to look at the ecological versus unecological practices and alternatives.

- The **energy** group researched the electricity pathway into their school to determine if it originated from coal, petroleum, hydro, nuclear or other sources and examined the environmental impacts of these sources.
- The **recycling** group looked at the status of local landfills and how much trash their school contributes to the waste stream.
- The **gardens/landscaping** group chose to study the different forms of composting and compostable materials.
- The **water** group explored the history of water use in their region.
- The **food and nutrition** group researched current USDA health standards for

school lunches and formulated questions for an interview with the food service director.

• The **chemicals** group began by researching the effects of toxic chemicals on humans and the environment. They compared the effectiveness of pesticides versus organic pest controls (see *resources* on pg. 6).

Draft a proposal outlining how you will carry out your audit.

Phase II: Based on research and procedures audit your campus in the subject areas.

The **energy** group:

• looked at the school's energy bills to survey total energy consumption and monthly variations throughout the year. They got permission from the school administration for this step.

• checked behind ceiling panels for proper insulation, assessed the efficiency of the existing light bulbs and fixtures and found out if lights and computers in different rooms were being left on unnecessarily.

The **recycling** group:

• assessed the existing campus recycling program and audited selected trash cans to see what kinds of recyclable goods were being thrown away.

• interviewed the copy engineer to see which departments used the most paper.

• surveyed peers and administrators to get ideas on improving recycling on campus.

The **composting** group:

• looked for an area on campus suitable for locating a compost site.

• visited the cafeteria and spoke with the staff to see what may be composted.

• researched costs for building worm-composting bins.

• discussed strategies to get the whole school involved in saving and collecting compostable material.

The **water** group:

• got permission from the administration to look at water bills.

• interviewed representatives from the city water department to see how the school might decrease its water consumption.

• spoke with janitors to investigate potential sources of wastage at the school (What time of day does the school water? Do toilets have low-flow mechanisms?)

• tested drinking fountains around campus for levels of lead and pH, using equipment from the chemistry class to collect and test water samples.

The **foods** group:

• took a tour of cafeteria operations led by the food service director.

• compared the nutritional value of the cafeteria menu with USDA standards.

• surveyed peer opinions on improving the school lunch menu.

The **chemicals** group:

• investigated the "state of toxicity" on campus. They interviewed groundskeepers, custodians and cafeteria workers and made a list of all chemicals used on campus.

• researched the health impacts of those particular chemicals and the costs of finding less harmful means of maintaining school grounds. They found that the herbicide 2,4-D contains highly toxic dioxins known to cause cancer in humans.

Phase III: Present findings and recommendations to class and school board. Outline costs and benefits of proposed changes.

The **energy** group:
• estimated costs of improving insulation and switching from halogen and incandescent lights to more efficient compact fluorescents.
• discussed strategies to persuade teachers to turn off their lights and computers when not in the classroom.

The **recycling** group:
• drafted a master recycling plan for improving the existing recycling program. They included procedures, costs of necessary materials, potential earnings and potential of diversion from local landfills.
• outlined costs for the administration to buy recycled paper for school offices and copy rooms.
• posted signs near copiers encouraging teachers to double-side their copies.
• posted flyers reminding their peers to use recycling bins.
• recommended replacing disposable plates with reusable platters or replacing Styrofoam plates with recycled paper plates in the cafeteria.
• urged teachers to place white-paper recycling boxes in their rooms.
• solicited the involvement of the campus ecology club in developing long-term collection strategies for all recyclable materials.

The **composting** group:
• launched their own composting program and constructed their own compost bin.
• worked with the maintenance department to purchase expandable compost bins.
• gathered lawn clippings, leaves and left-over vegetable waste from the cafeteria to create their own compost.

The **water** group:
• recommended that the school try landscaping with non-water-intensive plants more appropriate to their eco-region.
• summarized the costs and benefits of installing or improving the school's water filtration system.
• outlined costs for switching to low-flow mechanisms on toilets.

The **foods** group:
• showed how their school lunches contended with national nutrition standards.
• presented suggestions from their peer survey to the food service director. One idea was to include "extra-healthy" items on the menu one day each week and to get student feedback to monitor success. Student suggestions included adding a salad bar, garden burgers, beans, rice and vegetable combinations and reducing sodium-rich and fat-laden foods.
• recommended an ad campaign to make new menu additions visible to students.

The **chemicals** group:
• suggested several alternatives to chemical use including weed-tolerant plants, "hands-on" weed removal and using biodegradable detergents and cleaning solvents.
• informed other students and parents about the chemicals used on campus and their associated health effects.
• persuaded groundskeepers to post signs on areas treated with toxic chemicals.

For more help in conducting your school audit contact:

Dan Sponaugle/Carl Leach
Mira Costa High School
701 South Peck St.
Manhattan Beach, CA 90266
(310) 318-7343

Alliance to Save Energy
1725 K Street NW, Suite 509
Washington, DC 20006
202-857-0666

Northwest Coalition for Alternatives to Pesticides (NCAP)
P.O. Box 1393
Eugene, OR 97440
503-344-5044

Energy Efficient and Renewable Energy Clearinghouse
P.O. Box 3048
Merryfield, VA 22116
800-523-2929

Resources:

Energy Audit: A State-by-State Profile of Energy Conservation and Alternatives
Public Citizen
215 Pennsylvania Avenue SE
Washington, DC 20003
202-546-4996

Renew America
1400 16th Street NW, Suite 710
Washington, DC 20036
202-232-2252

Planning for Non-Chemical School Ground Maintenance
Northwest Coalition for Alternatives to Pesticides (NCAP)
P.O. Box 1393
Eugene, OR 97440
503-344-5044

The Art of Composting
Metropolitan Service District
2000 SW First Ave.
Portland, OR 97201-5398
(503) 221-1646

Environmental Action
Available from *E2: Environment and Education*
881 Alma Real Drive, Suite 118
Pacific Palisades, CA 90272
(310) 573-9608

Environmental Action, published by the non-profit*E2: Environment and Education* is a teacher/student curriculum guide. This supplementary curriculum consists of six separate topic modules: "Food choices," "Chemicals," "Source Reduction & Waste Management," "Energy Usage," "Water Usage" and "Gardens & Habitat Enhancement." The guidebook contains background information and student activities for each subject.

Cost: *Teacher Edition*: $12.95 *Student Edition*: $5.95

Blueprint for a Green School

This is an all-encompassing resource that describes campus audits in several environmental areas. See page 35 for details and ordering information.

The Trash Bag Project

"How much trash did you make today?"

Like the school audit, this project also requires students to look at their own consumption habits on an individual level. When we throw "away" trash in the waste basket we separate ourselves from our impact on the environment. This project connects students to the effects of their behaviors and encourages a new look at the individual's actions.

The following guidelines are reprinted as submitted by Cindy Stuffmann, Louisville High School Earth Science teacher and project creator.

1. Beginning (day/date), you are to save **ALL** of your non-food trash for a period of __days.
2. During school hours, any trash you generate should be stored in a plastic bag and carried with you at all times.
3. At the end of each day, this trash should be stored in a larger bag at home along with any trash you generate there.
4. All food containers must be rinsed well before storing in your trash bags.
5. No passing on trash to other students, friends, etc. The wrappings from anything you purchase (milk carton, newspaper, etc.) whether for yourself or your family, count as part of **your** trash. You are responsible for your decisions as a consumer.
6. **NO RECYCLING** of any trash until after everything has been weighed at the end of the week.
7. On (day/date), you must put all of your accumulated trash into one bag and weigh it on a bathroom scale. Then, separate out all of the recyclable items like glass, aluminum, paper, plastic, etc. (if your neighborhood does not provide recycling bins, the paper and aluminum can be recycled at school, and the plastic and glass can be taken to a community recycling area or given to a friend who does have neighborhood recycling). Finally, weigh the remaining trash; if you have very little trash left, this may involve weighing yourself with and without the trash and subtracting these amounts to get the weight of the trash.
8. On (day/date), you are to turn in your completed project worksheet. Be prepared to discuss your conclusions during class.
9. Be very aware of what you're doing all week - throwing things into wastebaskets and trash cans is something we tend to do without thinking about it, so do whatever is necessary to help you think first. At home, you might remove the wastebaskets from your room, and bathroom, and put some sort of note on the kitchen trash can or other receptacles you share with your family. At school, remind each other to put every piece of trash in your bags.
10. Once something is in your bag, you cannot take it back out again. Before you throw something away, think about whether you might get any further use from it.

Please note: This project will only have value if you really pay attention to what you are doing and if you are honest. Every day and every piece of trash matters!

Trash Bag Project Worksheet

The following worksheet is to be filled out by participants at the end of the project.

Number of days you participated in this project: _____
Total weight of all non-food trash **BEFORE** recycling: _____lbs.
Average per day: _____lbs. Projected average per year: ____lbs.
Total weight of all non-food trash **AFTER** recycling: ____lbs.
Average per day: _____lbs. Projected average per year: ____lbs.

Short essay questions:

Explain why these amounts may not be very accurate in representing how much trash you really generate over a longer period of time._____

_____

_____

_____

_____

Describe any ways in which this project made you more aware of what you "throw away."_____

_____

_____

_____

_____

_____

Explain any adjustments you made in your habits in the course of this project.

_____

_____

_____

_____

_____

Describe your reactions to this project in terms of any long-term goals or behaviors.

For more information about the trash bag project contact:

Earth Endeavors
P.O.Box 6130
Torrance, CA 90504
(310) 535-2419

Recycling at Your School

"We could be saving some of our resources."

Making your school more sustainable is a realistic goal that instills environmental ethics and may even yield revenues for your school. Starting a comprehensive program may just require the help of one or two teachers or a group of motivated students.

Students from Gahr High School in California have a successful paper recycling program. They have placed white paper and mixed paper recycling boxes in each teacher's room. English teacher Julie Meadows sponsors the program. She allows class time for teams of alternating students to collect the boxes daily and bring them to her room where paper is stored. Once a week she takes the paper to the local recycler. The program is such a success that the vice principal has offered to help expand the program next year and contract a hauler.

In the Beginning

- Form a committee to develop strategies and goals.
- Conduct a waste audit to determine how your school could be improved.
- Decide whether you will transport recyclables yourself or contract a hauler.

Find Your Local Recycler or Hauler

After you have audited the content of your school's waste stream, contact local recyclers and haulers. You can find them in your yellow pages or by calling your city or county solid waste division of the public works department. Recyclers operate profit-making businesses. The services, materials collected and prices they offer will vary between recyclers. Try negotiating.

Questions for Recyclers

Which materials will you accept? Which materials will you pay for? For which materials do you charge a fee? How should materials be separated and stored? Do you offer services such as providing containers, assistance in organizing the program and/or transport of recyclables from the school?

Transportation Options

Some recyclers and garbage haulers will transport your recyclables. The collector usually provides large outdoor bins or dumpsters for hauling materials. Some will only collect materials with high market value. Others may pick up materials for free in exchange for rights to sell the materials. Of course, you always have the option of loading your car or van and transporting your own materials.

Paper Recycling

Since paper makes up the largest percentage of the waste stream we will outline a paper recycling program below. These guidelines may be applied to starting glass and plastic recycling programs as well.

Classroom Paper

Paper can be classified as either "white" or "mixed." In each classroom place two small collection bins (cardboard boxes will do) with signs indicating their use (white/mixed). Some recycling centers will take all recyclable paper in one container as mixed paper. Consult your recycler for specifics.

Office Paper

Speak with administrative employees to agree on the best spot to place recycling bins and how often collection will take place. The school library is another place to collect paper. In addition to white paper and mixed paper, the library carries newsprint, books and cardboard, all of which can be recycled.

Collection

Collect paper daily or weekly from classrooms and offices. Arrange a pick-up time for student teams or janitors who might be able to collect the paper. Materials should be brought to a central storage area. To comply with fire codes, it is best to have paper uncrumpled and stored flat in closed containers.

Generate Enthusiasm!

Keep records of weekly, monthly and annual recycling totals and of money earned by the school. Make announcements in the school bulletin and newspaper to update the student body about the program's progress. Have a committee of students talk to different classrooms about supporting the program.

For more help in starting a recycling program contact:

National Recycling Coalition
1101 30th St., NW, Suite 305
Washington, DC 20006
(202)625-6406

Ecology's Recycling Info. Line
1-800-RECYCLE

Resources:

How to Set Up a School Recycling Program
Council for Solid Waste Solutions
1275 K Street, NW Suite 400
Washington, DC 20005
800-2-HELP-90

The Road to Recycling--How-to Manual
Environmental Action Coalition
625 Broadway, 2nd Floor
New York, NY 10012

Recycling at School
Division of Recycling of CA Dept. of Conservation
1025 P Street, Room 401
Sacramento, CA 95814
(916) 323-3508

School Recycling Programs
US Environmental Protection Agency
401 M Street, SW
Washington, D.C. 20460
(202) 260-2090

Recycling Partnerships for Schools and Businesses
Mid Peninsula Environmental Education Alliance
2448 Watson Court
Palo Alto, CA 94303
(415) 494-9301

Blueprint for a Green School (see page 35)

Gardening and Composting

"If we treated the whole earth as a garden,
we'd be taking a lot better care of it than we are now."

Gardening and composting programs employ a variety of disciplines with a hands-on approach that connects students to the earth and to each other. Laytonville's vermicomposting is an integral part of their extensive gardening program. The following information was written by Binet Payne, the teacher who started the program.

The Garden Project

In September 1987, I established an educational garden in Laytonville (CA) called the Garden Project, where I teach science, math and language arts. Currently, we have a student population of 480 students, preschool through eighth grade. We began our garden with three raised beds and three interested teachers and their classes. Presently, the garden project contains 30 raised beds and serves fourteen teachers and their classes. My applied science class grows produce and students sells it to the school lunch program. Extra produce is donated to the community, and the remainder is sold at "Middle School Market," which is held daily, in front of the school. As parents pick up their children from school, they can pick up fresh vegetables for dinner as well. Produce is also taken home by students who grow food for their families. Many classes have teaching gardens located outside of their classrooms as well. We have a native plant garden, a small water garden, butterfly gardens, a sensorial garden and herb gardens. The school gardens are integrated with the existing science curriculum and provide both staff and students with a rich learning laboratory. The garden project is a multifaceted program with a strong emphasis on organics and on building and maintaining sustainable communities. We also have a cross-age tutoring program and enlist parent volunteers.

Large Scale Vermicomposting at Laytonville

For two years we experimented with small scale vermicomposting in an effort to determine if we could successfully use red worms to compost our cafeteria food wastes. In September of 1991, the student council voted to use their student funds to pilot a large scale vermicomposting project. Now with the exception of meat, milk and cheese, we compost all of our cafeteria food waste and some of the cafeteria paper waste. We do not compost napkins for health reasons.

To begin the large-scale vermicomposting project we purchased redwood, plywood and nails. The students then constructed four large compost bins measuring approximately 4 feet by 8 feet. Full standard sheets of plywood were used for the top and bottom of each bin. The bins are 12 inches deep. This is very important as it enables the children to turn the compost themselves. Wet compost is very heavy and if students can't effectively turn it, you are going to have problems with anaerobic bacteria which will slow the decomposition processes and create foul odors. To allow excess moisture to escape, students drilled holes in the plywood bottoms every twelve to eighteen inches. A piece of black plastic is kept on the top of the bedding in each box to help retain moisture. Once we add water

to the initial bedding, the food waste keeps the bedding evenly moist, and we have no need to add more water until new bedding is added. We also have a large holding bin where we store the finished vermicompost until ready for our use. By not taking vermicompost from a 'working bed' we avoid adding fresh food waste to our vegetable garden.

The bedding for our worms comes directly from our school site. In each classroom paper is sorted into separate boxes. Glossy and office paper go into one box while colored construction paper, news print and lunch bags go into another. One day each week, students transport the paper in garden wheelbarrows to the shred shed where they sort it. Glossy and office papers go into the janitor's truck to be taken to the recycling center. The rest is fed by students into the electric shredder and is eventually used as the bedding for the worms.

Students monitor the bins and manage the entire program. The process begins in the cafeteria where students and staff separate vegetable waste from neat waste and other recyclables. The food to be composted is picked up daily by students who weigh it and then chart the weight. A large bar graph is located in the cafeteria and records the amount of food we are vermicomposting on a weekly basis. We have compared the amounts we composted to the lunch menus and have made some interesting correlations. The food waste is then placed into the worm bins. The food is buried in trenches about every two feet. We start at one end of the bin and move to the other end over successive days. When we come to the end of the first bin we move to the other end over successive days. When we come to the end of the first bin we move to the second, and so on until the rotation starts again at the first bin. This last year we averaged about twenty pounds of food waste each day. Each vermicomposting bin has a clip-board for students to record information pertaining to the healthy maintenance of each bin. Example: the location of food buried, worm populations, pH, moisture, and other variables are monitored daily or weekly. Adjustments to the bins are made by using student observations. Food may need to be withheld if there is a fruit fly problem. Or perhaps more bedding may need to be added because the bin is too 'hot' due to the natural occurring composting of food waste. When it is time to harvest the vermicompost, about every two or three months, it is removed using a "top-harvesting method" which we have found to be much less time consuming then "dump and sort." As a second stage in the process, we have a large holding where we store the vermicompost until we are ready to use it for our gardens. Vermicompost is a combination of vermicompost along with partially decomposed bedding and food wastes. The holding box allows us to use the finished vermicompost without adding fresh food waste to the garden.

Although the worms slow down their feeding in the winter when temperatures are colder, the small amount of heat generated by the composting food waste is enough to keep them feeding quite well. We have found that the large size of the beds helps insulate them against the heat and the cold. Our temperatures can rise into the nineties and fall below twenty degrees F in the winter.

Through education, recycling and vermicomposting, Laytonville Unified School district has been able to reduce school garbage by 60-80 percent.

We have eliminated our need to purchase fertilizer for the garden. Last year alone we composted over 2500 pounds of cafeteria food waste in a ten month period and saved our district $6000 in dumpster fees.

The Garden and Recycling Project is a concerted effort of the whole school, including administrators, teachers, kitchen staff, parents and above all students, students who feel they are making a difference. When students begin to feel they can make changes in their environment they also begin to believe they can make changes in their own lives. Having gardened with students in an educational setting for the last eight years, my experience has taught me that placing children in a garden has a profound effect on the way they view themselves and others. Something happens when a student begins to care for a seedling or an earthworm. When they take care of something and it flourishes and grows, they are nourished by this giving and they grow. As adults we need to help our children make these connections. Our children are told, and they know that the earth is in trouble. We need to help them find viable solutions--solutions which nourish them and the planet we live on.

I am a firm believer that our children are indeed our future, and my students are equally firm in their belief that if we can convince other school districts to compost their cafeteria food waste and paper wastes we can play an important role in reducing the vast amount of the waste going into our local landfills. This year, we will begin the third year of our vermicomposting project. Please join us!

For more information on gardening and composting projects contact:

Binet Payne
Laytonville's Educational Gardens and Recycling Project
P.O. Box 325
Laytonville, CA 95454
(707) 984-6123

Tammy Bird
Crenshaw High School
5010 11th Ave.
Los Angeles, CA 90043
(213) 295-4842

National Gardening Assoc.
180 Flynn Ave.
Burlington, VT 054401
(802) 863-1308

American Community Gardening Assoc.
325 Walnut Street
Philadelphia, PA 19106
(215) 265-8250

(Resources on next page)

Resources:

Children's Gardens (K-8)

Includes: how-to information on choosing a site and constructing a bed, information on irrigation, composting, tools, fertilizers, plus a growing guide, a guide to resources and at least 30 suggested activities from pest management to building a scarecrow.
Available from ***Common Ground Garden Program***
2615 South Grand Street Suite 400, Los Angeles, CA 90007-2668
(213) 744-4341

Gardening Answers

Provides quick answers to the most commonly asked questions about: seed selection, planting, soil analysis, pH, fertilizers, planting dates, transplanting, seed storage, cultivation, mulch, insects, sources of supply, harvesting and more.
Available from ***Storey Communications Inc.***
Schoolhouse Road, Pownal, VT 05261 (800) 827-8673

Growing Ideas

Published three times a year by the National Gardening Association, this **newsletter** for teachers provides instructional ideas, horticultural information, and a forum for exchange among teachers using classroom gardening to stimulate learning.
Available from ***National Gardening Association***
180 Flynn Ave., Burlington, VT 05401 (802) 863-1308

Composting to Reduce the Waste Stream

This 48-page guidebook shows how to start educational programs on composting. It covers the composting process, how to construct and maintain a compost pile and the uses of compost.
Available from ***Northeast Regional Agricultural Engineering Service***
152 Riley Robb Hall, Cooperative Extension, Ithaca, NY 14853 (607) 255-7654

Worms Eat Our Garbage

This interdisciplinary curriculum is organized into three sections: "the world of worms," "worms at work" and "beyond the bin." Activity pages have background information, materials needed, directions and activities.
Available from ***Flowerfield Enterprises***
10332 Shaver Road, Kalamazoo, MI 49002 (616) 327-0108

Rodale's Illustrated Encyclopedia of Herbs

Contains useful information about medicinal herbs that can be grown in classroom gardens including: history, medicinal uses, growing conditions and cultivation of nearly 170 herbaceous plants native to North America.
Available from ***Rodale Press***
33 East Minor Street
Emmaus, PA 18098 (215) 967-5171
Editor: Claire Kowalchik ISBN 0-87857-699-1

Blueprint for a Green School **(see page 35)**

Includes an entire chapter on school gardens and composting.

Outdoor Classrooms

"Giving students a better sense of what their natural world is about."

Outdoor classrooms are an innovative way to teach students about the world around them. Whether it's designing the layout of your natural area, working to get materials donated or studying micro-organisms in the aquatic habitat, the entire experience is **hands-on** for the students. The benefit of creating an outdoor classrooms is being able to teach sciences through direct experience. Students learn about the native flora and fauna (natural systems) in their own local environment.

Chances are, somewhere on your campus you could find an unused portion of land. We've run across natural areas built right next to street corners. Others have been located in small courtyards on campus. Where is the unused portion of land on your campus?

Time Period

At the schools we visited, constructing foundations and waterways, researching and acquiring native plants and installing the irrigation system took anywhere from **one to three school years.** Once this foundation is built, the area will continue to evolve and grow over time.

In the Beginning

Form a student committee, making sure to include younger students who will be there for the long-term. Committee responsibilities include soliciting financial support, expertise and donations from community members and businesses, seeking publicity from the local press, researching the appropriate native plants to include, designing the layout and, of course, providing manual labor.

Helpful Hints

• Organize fund-raisers. Some ideas include jog- or walk-a-thons in which students are sponsored per lap around the school track, T-shirt sales, car washes, bake sales, etc. (See page 36 for more fundraising ideas.)

• Build alliances with other teachers who may use the area in the future and set a schedule for those teachers to bring their classes out to work.

• Consult landscapers, naturalists and ethnobotanists when designing your area.

• Take committee members on field trips to local areas to determine which native plant species to incorporate. Seek the help of native plant societies, your state Fish and Game department or local naturalists in finding and propagating native plants.

• Make the project visible! Seek media and print coverage. This will bolster community support. Have committee members visit different classes to inform the student body and ask for help. Put announcements in the school bulletin.

• Offer extra-credit for students who help after school and on weekends. Make this opportunity open to students from any class.

Design and Study

Outdoor classrooms can range from the small scale (freshwater ponds and herbal/native plant gardens) to the large scale (waterfalls, streams and riparian vegetation, trees, wildlife and distinct vegetative zones). Creating distinct vegetative zones gives students the opportunity to observe and compare the differing habitat conditions of various species and how ecological relationships change in various micro-habitats. Keep in mind that the best model for designing your natural area is your **local environment**.

Students at Deer Valley High School in Arizona planted riparian vegetation along their stream. The shade that developed with the growth of this vegetation imitated natural functioning riparian systems. The soil in and around the stream bed evolved to bear moisture-loving plant species and various micro-organisms. In contrast, the micro-habitat of the "desert wash" region in full sunlight contained different soil composition and vegetative species all together. By constructing several habitat zones the area becomes a working model of natural systems.

Suggested Topics to Study

• **Comparing plant and insect species between habitats**: In a 3x3 quadrant, students look at how species vary between habitats, analyzing the different factors (soil type, particle size, temperature, shade) that contribute to the biodiversity of an area .

• **Analyzing ecological relationships**: Students study relationships between plant species. A creosote bush, for example, won't grow next to a prickly-pear cactus because the creosote has a deep root structure whereas the cactus has a shallow one. This enables the cactus to suck up much of the water before it reaches the roots of the creosote. Students also investigate why certain animals and insects prefer to feed upon and inhabit particular plants. These kinds of relationships can be built into the area and examined.

• **Looking at plant adaptations and characteristics**: Students analyze why certain shrubs have developed small leaves with waxy coatings while other herbs have large soft leaves. Other study topics include the survival strategies of competitive plant species, how individual species are pollinated and how plants spread their seeds.

• **Ethnobotanical studies:** Why leave ethnobotanical studies for museum researchers? Ethnobotany combines the historical, cultural and health disciplines in the study of plants and their uses. Studying native plants used for medicines by Native Americans can give students a new understanding of a plant's historical and cultural value.

• **Teaching others:** Once students have comprehensively learned about the natural study area, they can further the learning process by mentoring younger students. Barry Goldwater High invites local elementary school classes to come visit the natural area. The high school students teach them about everything from aquatic life in the pond to desert survival tactics of specific plants.

Note: Think of other ways to learn in your outdoor classroom. Why not use it to explore art, English, social sciences or other subjects?

For more information about outdoor classrooms contact:

Chuck Bell
Deer Valley High School
18424 N. 51st. Ave.
Glendale, AZ 85308
(602) 938-4450

Barbara Henderson/Nancy Duffield
Barry Goldwater High School
2820 West Rose Garden Lane
Phoenix, AZ 85207
(602) 581-7838

Resources:

Guidelines and Features for Outdoor Classrooms

This publication for teachers provides fundraising ideas, design strategies, tips on how to get support from fellow teachers and other information on how to get a program started. **cost: $2.00**
Available from **Indiana Division of Forestry, Project Learning Tree**
402 West Washington, Room 296
Indianapolis, IN 46204
(317) 232-4105

Education Goes Outdoors

This publication includes outdoor language adventures, schoolyard math investigations, art experiences in nature, explorations in social studies and science beyond the classroom. **cost: $22.50**
Available from **Addison-Wesley**
2725 Menlo Park, CA 94025
(800) 447-2226 -or- (415) 854-0300

II

Off Campus

The Local Environment

Business Audit

"Making an investment in conservation."

This program involves students in selecting and auditing a local business and then making recommendations to help the business improve its ecological decision-making. The steps of this project are similar to that of the school audit (see page 3). Students investigate various aspects of the business environment, research alternatives to over-consumptive practices and present recommendations to the managers or owners.

In the Beginning

Students:

- decide which types of business might need the most improvements (i.e. law offices, restaurants, banks, supermarkets, medical offices, real estate offices, etc.).
- contact your local Chamber of Commerce to find out which businesses would be receptive to participating in this project.
- write a one-page proposal to inform interested businesses about the steps involved in the project.

Helpful Hints

- Inform businesses that this is a school project and that other businesses in the community are participating as well.

- Students should do some preliminary research so when they make recommendations to their adopted business, they can provide addresses and phone numbers of environment-friendly services and product suppliers and costs of recycled paper, compact fluorescent light bulbs, etc. (see *Resources*,on pg. 20)

- When doing this research, have students record "catchy" statistics like: "Switching to compact fluorescent light bulbs saves an average of XX hrs./month," **-or-** "recycled paper saves XX trees and XX energy." Relate these statistics to $$$ saved whenever possible.

- Follow-up calls or visits are important. This is a good way to check on progress and to answer questions businesses may have.

- Give "eco-awards" to businesses that show strong improvements.

Recommendations You Can Make to Any Business

I. Recycle.

1) Recycle paper, newsprint, glass, cans, and plastic generated by the business, employees and customers.
2) Set up recycling bins.
3) Use recycled paper for stationery needs like letterhead, publications, computer and copy paper, envelopes, etc. The higher the post-consumer waste content the better.
4) Make note pads out of single-sided waste paper by gum-binding and cutting to size This can be done at most copy centers or print shops.

5) Set up "buying circles" with neighboring businesses to purchase recycled paper.

II. Conserve Resources.

1) Entice your employees with incentives to carpool or use mass transportation.
2) Purchase energy-efficient light bulbs, lighting fixtures and faucets.
3) Use "water dams" in your rest room toilets to reduce water use.
4) Plant trees around your building.
5) Put bike racks in front of your building.

III. Avoid Environmentally Hazardous Products and Practices.

1) Use safe, chemical free cleaning products for your office, rest rooms, counters, etc.
2) Use toxic free paints.
3) Encourage the use of cloth bags for groceries and other purchases by providing the bags free or at a low cost.

IV. Invest responsibly.

1) Keep up on product boycotts, and refuse to use these products.
Read *Co-op America Boycott Action News*. (see *Resources* next page).
2) Invest your money in environmentally responsible corporations or money funds.
3) Donate a certain percentage of your profits to environmental groups.

V. Educate Your Customers and Employees.

1) Make environmental literature available.
2) Post notices of boycotts or local environmental events.
3) Put environmental tips in any publications you have.
4) Tell your customers what you are doing for the environment and why.

VI. For Retail Businesses and Restaurants.

1) Carry only environmentally safe, biodegradable or recyclable products and organic produce. Purchase products with the least amount of packaging.
2) Sell cloth shopping bags (with your logo!) for customers to reuse.
3) Offer small discounts to customers who bring their own coffee mugs, or their own containers for bulk products.
4) If you ship products, reduce your own packaging. Buy a paper shredder and use the shreds rather than styrofoam peanuts or plastic bubble sheets.
5) Put labels or signs on shelves to make customers aware of recycled, biodegradable or environmentally safe products.
6) Donate your leftover food to a food bank.

For more help in conducting a business audit contact:

Adopt-a-Business (as featured in the "Business Audit" segment of the video)
Michael Arenson is the coordinator of this curriculum package available from the
Environmental Council of Santa Cruz County
P.O. Box 1769
Santa Cruz, CA 95061
(408) 426-2286

Resources:

50 Simple Things Your Business Can Do To Save the Earth
Available from EarthWorks Group
1400 Shattuck Av. Box 25, Berkeley, CA 94709

Growing a Green Business by Sheri Boucher-Flynn
Available from World Disk Productions, Inc.
P.O. Box 2749, Friday Harbor, WA 98250 (800) 228-5711

Save the Earth at Work
Available from Bennett Information Group/Bob Adams, Inc.
260 Center St., Holbrook, MA 02343

Co-op America
2100 M St. NW, Suite 403, Washington, DC 20063
(202) 872-5307 -or- (800) 424-2667
Catalog carries biodegradable solar products, full-spectrum light bulbs, recycled paper and bathroom tissue, cloth grocery bags and more. Also, they have responsible investing information, boycott updates, and a directory of almost 500 socially and environmentally responsible businesses.

Seventh Generation Catalog
10 Farrell St., South Burlington, VT 05403 (802) 862-2999
Sells industrial-size, heavy-duty paper trash and refuse bags, plus energy efficient light bulbs. Other ecological products available as well.

Recycled Paper Suppliers:

Atlantic Recycled Paper Co.
332 Rossiter Ave. Baltimore, MD 21212 (301) 323-2676
Conservatree
10 Lombard St. #250 San Francisco, CA 94111 (800) 522-9200
Earth Care Paper Co.
P.O. Box 14140 Madison, WI 53714-0140 (608)277-2900

Non-Toxic, Biodegradable Cleaners:

Enviro-Clean
30 Walnut Avenue, Floral Park, NY 11001 (800) 466-1425
Full line of retail, wholesale and bulk non-toxic cleaning products. Free catalog. Hospital, business, school and home use.

Energy Efficiency and Alternative Energy:

Real Goods Trading Co.
3041 Guidville Rd., Ukia, CA 95482 (707) 468-9241
A complete line of money-saving, eco-friendly alternative energy products available by mail. Also carries non-toxic cleaners and recycled paper products.

Studying Your Local Environment

"Students can find out what's going on around them..."

Local environmental and community studies are relevant in any school, whether rural or urban. When students have the opportunity to investigate the world around them, the learning experience expands and diversifies to pertain to the students' lives. Research, writing and problem solving skills are developed with the addded bonus that students have gained a greater understanding of their surrounding environment.

These studies can be used as a starting point for other projects like *Performing Arts and EE* (pg. 24.), *Making a Documentary* (pg. 26), an *Environmental Newspaper/Newsletter* (pg. 28), a *Slide Show* (pg. 30) or any other project you can think of.

Helpful Hints

- Set aside class time to discuss local environmental issues in an informal way, citing newspaper articles and asking students to think about how they might approach different topic areas.
- Have students develop a plan of action wherein they outline potential issues to study, find local agencies and organizations to contact and create a timeline for project completion.
- Have students keep a weekly journal of their work and organize their studies around an oral presentation or research paper.
- Obtain parental approval for students who are conducting research in the field.

The following are some local environment studies we've encountered:

- Students contacted their *Fish and Game* office and grassroots organizations to learn about local ecosystem dynamics, endangered species, native plant species, etc.

- In one area where water shortage was a problem, students analyzed the issue. They learned about the water subsidy that is granted to farmers to keep produce and grain prices down. Since farmers can get cheap water, they tend to waste a lot of this precious resource. Students identified this as a problem, looked at the politics and economics behind the issue and wrote a proposal to the state water quality board expressing their concerns and potential solutions.

- Students have tackled the waste issue. They studied their municipal landfill considering its location, projected closure date and waste reduction strategies. They discussed ways to improve the community recycling program.

- Three students from Brush High School studied the potential effects of a controversial land development project on a nearby creek. They spoke with members of the zoning board, the city council, attended zoning meetings, took pictures of the site and rallied their neighbors to get involved. Their efforts helped to halt the proposed development.

Water Quality Monitoring

"...to monitor the stream that's in my backyard."

We all live in a watershed. No matter where your school is located you can probably find a stream or other waterway nearby. Human civilization is inextricably tied to water, making this a universally relevant project. In our travels, we have found students testing streams, oceans, lakes, estuaries and rivers for a whole range of water quality factors including fecal coliform, pH, nitrates, phosphates and other chemicals. This hands-on, real-world activity gets students involved in the scientific process.

What makes these studies meaningful is to monitor **change over time**. Often teachers and students will be inclined to visit random sites and then fail to return to the same sites over time. This makes it difficult, if not impossible to detect **changes** in the water quality. In order to be effective, it is important to select several sites and return to these same sites consistently so a long term record can be established.

This record can be a stepping stone to understanding the bigger picture. Some students, having discovered polluted waters, went upstream to talk to local farmers, cattle ranchers and companies to discuss more sustainable land-use practices. Students in Ottawa, Canada made a video about their local water issues and used it to raise awareness in their community. Other students discovered a sewage leak and informed their city, which immediately repaired it. As seen in the video, students at Capital High testified to their state legislature, resulting in a ban on phosphates in laundry detergents in their state.

Listed below are organizations that specialize in water quality monitoring. These organizations are nationally based and offer water quality testing kits, educational materials and networking information.

Global Rivers Environmental Education Network (GREEN)

721 East Huron St., Ann Arbor, MI 48104 (313) 761-8142

GREEN is an innovative, action-oriented approach to education that uses water monitoring to bridge classroom disciplines and connect community members. GREEN recognizes the value of water to life on Earth and works to achieve clean water for all. The GREEN office in Ann Arbor serves as the hub of this international network. They develop and refine programs in environmental monitoring and educational methodologies and distribute information, water curricula and resource materials. They have an excellent field manual that details nine water quality tests and includes information about computer networking. The office also facilitates some of the networking among GREEN members.

Izaak Walton League of America

Save Our Streams Program

707 Conservation Lane, Gaithersburg, MD 20878 (301)548-0150

This organization works from the principle that all people (students, homemakers, hikers, anglers, etc.) can greatly improve the water quality of nearby streams through regular monitoring. By detecting signs of deterioration early, creative approaches can then be taken to solve these problems. Founded in 1969, it

has expanded to include several thousand active projects across the U.S. The *Save Our Streams Adoption Kit* ($8) contains information on how to organize a project, monitor water quality and recognize and report stream abuses. It also includes restoration ideas, educational fact sheets and more. The IWLA is also working on a teacher's manual for grades 1-12 with a focus on water quality and land use. Contact the headquarters to find which one of the 400 local chapters and 21 state divisions is closest to you.

The G.L.O.B.E. Project

Global Learning and Observation to Benefit the Environment
744 Jackson Place NW, Washington, DC 20503 (202) 395-7600

The G.L.O.B.E. Project was announced by Vice-President Al Gore as an effort to involve students in scientific studies to protect the environment. Students in grades K-12 will be collecting data in their local environments which will then be sent to scientists via telecommunication satellite and the internet. The scientists will use the raw data to help the environment and will share their findings with the students.

The River Network

P.O. Box 8787
Portland, OR 97207-8787 (800) 423-6747 -or- (503) 241-3506

One way the River Network works to strengthen citizen and student involvement in river watershed protection is through their clearinghouse service. *The River Clearinghouse* provides local activists with information through a nationwide "800" number, a computer database of over 600 technical and scientific specialists, special publications, a quarterly newsletter and an extensive library of river protection resources.

River Watch Network

153 State Street
Montpelier, VT 05602 (802) 223-3840

River Watch Network provides high school and middle school teachers with the training and assistance they need to design and implement a river monitoring project. RWN gives teachers and students the opportunity to apply science skills to real life situations. They learn the physical, biological, and chemical parameters of a river, how these can be used to indicate water quality and how the information can be used to benefit the community. Services include student programs, teacher training, implementation assistance and clean water congresses. They also provide a variety of written materials that aid in project development and maintenance.

H.A.C.H.

P.O. Box 389 Loveland, CO 80539 (800) 227-4224

This company sells water quality testing kits designed especially for students and teachers to test for nitrates, phosphates, pH, fecal coliform and more.

Performing Arts and EE

EcoSound and Environmental Justice

"...Plutonium was placed in a spiritual spot..."

Finding a creative outlet for knowledge can provide a powerful incentive for students to learn about issues. "Education" takes on a new meaning as the learning happens automatically through the process of creating. Once students have become "experts" on an issue, they can use their creative energy and talents to communicate their new wisdom to others.

The EcoSounders in Seattle were given the task of writing and performing their own music video. The inspiration for their music was the issue of environmental justice. Project organizers contacted experts in this issue and set up field trips and "learning workshops" for the students to acquire first-hand knowledge. For example, they visited local farmers to learn about the health effects of pesticides on farm workers. They also spoke with activists who oppose the use of pesticides.

Next, the EcoSounders toured the Hanford nuclear facility and spoke with members of the Yakima nation and surrounding communities who have been adversely affected by this facility. Students took notes and asked questions, and their new knowledge provided them with a basis for their song-writing.

After learning in the field they began composing lyrics and music and choreographed their own environmental justice music video. This video was seen by students in other schools and aired on local television stations.

The Issue of Environmental Justice

The students of *EcoSound* explored the basic human right to live and work in just environments regardless of a person's race, ethnicity or socio-economic status. This is an important issue because it affects many people. Waste and toxic pollution are inevitable by-products of our industrialized society. They are prevalent in some form in almost every environment, whether urban or rural. An injustice lies in the fact that low-income groups and minority communities have been facing the effects of these problems more intensely than other demographic areas. The 1987 Chavis/Lee report Toxic Waste and Race in the U.S. estimates that "three out of every five Black and Hispanic Americans live in communities with uncontrolled toxic waste sites, and approximately half of all American Indians and Asian/Pacific Islanders live in communities with uncontrolled toxic waste sites." These groups often lack the financial and political power needed to prevent the intrusion of such injustices. Thus they bear the burden of the waste we all create.

Are there individuals or communities struggling for environmental justice near your school? If so, how can you use this as a case for studying the issue, and how can your students get involved in the political process?

For more information about environmental justice or *EcoSound* contact:

EcoSound
P.O. Box 22550
Seattle, WA 98122-0550
(206) 296-1675

Citizens for Environmental Justice
1115 Habersham Street
Savannah, GA 31401-6819
(912) 233-0907

Indigenous Environmental Network
P.O. Box 485
Bemidji, MN 56601
(218) 751-4967

Additional resource:

Confronting Environmental Racism--Voices from the Grassroots
Bullard, Robert 1993. South End Press: 116 Saint Botolph Street,
Boston, MA 02115
(617) 266-0629

III

Educating Others

Spreading the Word

Making a Documentary

"Harnessing the power of the visual media."

The process of making a documentary offers students an exciting and comprehensive way of learning about issues. By conducting research and interviews, students become "experts" on their topic. Once a project is complete, it may be used to educate other classes, schools and even the community via public access television.

If done well, a documentary can be a very influential tool. For example, one group of students in southern California focused on a golf course located next to a stream as a subject to examine the adverse effects of pesticide runoff on water quality. Students then used this video to persuade the golf course managers to use biodegradable insecticides and fertilizers.

As with most projects, there are many ways to work on a documentary. We will outline one simple and inexpensive way that can easily be incorporated into the classroom:

When we made a documentary at UCLA for an independent studies course, our professor split the project into two parts. During the first ten-week quarter we researched our issue extensively, reading books and articles and talking to community members tied to the issue. This was all put into a written report on the topic, which served as the basic structure and guide for assembling the video. Also, in the process of doing the research, we found a good angle from which to present the issue.

In the second quarter, now that we were "experts" on our issue we conducted interviews in the field and shot lots of footage using a home VHS camcorder. We included as many points of view as possible: industry, environmental groups and even the anti-environmental perspective.

Having shot about 12 hours of footage, we wrote transcripts of all the interviews and took notes of all shots. We were then ready to edit the video using the camcorder for playback and a VCR for recording the final edited version. This is a basic and inexpensive way to produce a documentary. Although the quality of the finished product wasn't quite good enough for the Discovery Channel, the content and what we learned in the process was enough to earn an "A" grade on the project.

Helpful Hints

In the Beginning

- Develop your ideas, structure and questions before going out to shoot. This will help you get the necessary shots, keep your footage down to a minimum and greatly simplify the editing process.
- Strive for objectivity by including voices from all sides of the issue.
- Take advantage of your community television facilities. Most cities which have cable TV offer free access to video equipment and training. Also, your school may have a media department with good equipment. Work with them. And if all else fails, you can always rely on the "camera-to-VCR" method.
- Set a production schedule for completing research, shooting and editing.

• Make a list and contact potential interviewees. Remember, no one is off-limits.
• Be flexible with your ideas. They are likely to change drastically over the course of the project.

Shooting

• When you go on a shoot, plan carefully to ensure that you get all the shots and interviews you need the first time out. You don't want to have to schedule re-shoots.
• When interviewing always use headphones so you know that audio is good. This will help you avoid some disasters!

Editing

• If shooting with an 8mm or Hi8 camera, transfer your original footage to 1/2 inch VHS tapes for viewing because over-scanning may damage 8mm tapes.
• Preparation is the key! Edit on paper before editing on tape. Log and transcribe all interviews and footage (using counter numbers for reference). Transfer your select sound bites onto notecards. Use these logs and note cards to lay out your story. This is a tedious task but it makes the editing job much easier and will help you to visualize your project better.
• Balance your narration with sound-bites of interviewees to tell your story.

For more help in making your documentary contact:

Jeff Barrie and Tyson Miller
Earth Endeavors
P.O. Box 6130
Torrance, CA 90504
(310) 535-2419

Environmental Newspapers

"Spreading the news"

Whether you work to get an environmental column published in your school newspaper or start your own newspaper/newsletter that focuses entirely on environmental issues, this kind of project educates the writers as well as the readers. We've seen papers that cover local and regional topics while others focus just on rain forest issues. We found the latter at McKenna Middle School in Wisconsin, featured below. The following guidelines were submitted by Butch Beedle, newspaper coordinator.

Tropical Tribune

McKenna's student-written newspaper **Tropical Tribune** is distributed to students, teachers, classrooms and schools around the country. The newspaper provides accurate and reliable rain forest information including problems they face, how to get involved in solutions and ways to network with other student efforts and interests. Over 2,500 copies of the paper are sold each year to readers in all 50 states, Canada, Australia, Peru and more. It is a collective effort of many people, each displaying different skills like writing, photography, word processing, drawing, organization, leadership and editing.

Time Period

Students spend about 7 **weeks** learning about rain forests. Writing and editing the articles takes about **three to five class days.** It takes **several weeks** after that to get all the stories finished, make revisions and lay out the paper.

Estimated Costs

Two editions are printed each year. The cost of printing 1,200 copies is $250 for each edition. These papers are mailed at a bulk rate of about $150 each mailing. Incidental costs for books and resources add up. Both editions can be printed and distributed for under $1,000. They charge $2.00 for each issue, which offsets production costs.

Getting Started

Articles dealing with the rain forest are collected from various newspapers and magazines year round. These are dated and filed as resources. Separate folders are created for sub-topics like "mammals", "weather", "indigenous peoples", "foods", "deforestation", "medicinal plants" and "ways to help the forest". Universities, organizations and authors are contacted for additional resources and stories. Guest speakers are an excellent source of primary information.

In social studies class, a large list of possible topics is generated. The list is printed out and students sign up for a 1st, 2nd and 3rd choice. Teachers assign stories according to interest, need and potential for completion. Before writing begins, teachers make sure that everyone has picked a topic and is familiar with the resources.

In the days before the paper is written, students sign up for one of three groups: *News/Feature, Editorial* and *Entertainment*. One teacher is assigned to each of the three groups. On writing day, the regular class schedule is suspended (including bells). Parents and community members are invited to come and help out. One teacher keeps all source materials in his/her room and acts as a librarian to coordinate research. The other rooms are work rooms. The morning is usually used for research and the late morning and afternoon are set aside for compiling the rough draft (Make sure students take notes and do their research **before** writing their rough draft). The rough draft must be checked by two students and a teacher before they can be typed. One student looks for grammar and punctuation and the other checks for meaning and readability.

Next, the computer lab is reserved for two days. Students with shorter stories start typing the first day. After articles are input into the computer they are laser printed on enamel paper. This heavy paper makes near-photo-ready copies that can be used by the printing house.

Now the student editors are ready to begin their work. Each work group has two student editors chosen by the teacher. The editors meet during homeroom time and lunch to make the major decisions about the paper. They wax the articles, lay out the paper and decide which stories will be printed.

The original is taken to a local printer and multiple copies of the newsprint version is produced. The issue is usually about sixteen pages. Throughout the school year, the paper is being marketed to teacher and kid magazines that might run a free ad or story. Flyers are sent to teacher conventions as well.

Helpful Hints

- How about a newspaper that includes local or regional issues?
- Talk with other teachers to see if they will sponsor their students to research and write papers on local, regional or global issues. These research papers can be edited and used as articles for the school newspaper.
- Work with the school journalism department and local printers to gain the expert's viewpoint on content, layout, etc.

For more help starting an environmental newspaper contact:

Butch Beedle
Teacher/Newspaper Coordinator
J.C. McKenna Middle School
307 South First Street
Evansville, WI 53536 (608) 882-4780

Environmental Slide Show

"With one slide show you can reach a lot more people..."

This simple project gave students from an economics class the opportunity to raise the level of environmental awareness in their school by presenting to other classes. Students researched issues like nuclear energy, air pollution, deforestation, endangered species and others. They compiled pamphlets consisting of facts, maps, graphs and solutions relating to the different issues. Then on Earth Day they invited other classes in for a slide show where each group delivered their presentation and explained the information in their pamphlets.

Time Period

Approximately two weeks.

Getting Started

- Find videos that are relevant to the students' topics and screen to class.
- Form groups of three to five students. Each group will study a different topic. Some suggested topics include consumerism, overpopulation, deforestation, nuclear and alternative energy sources, endangered species, air and water pollution, biodiversity and issues in the local environment.
- Have students research the issues at the school or public libraries, recording facts, graphs, maps and solutions to the problems.
- When relevant, students may analyze the political and economic factors behind the issues. The rain forest group, for example, paid attention to how consumer demand for cheap beef contributes to rain forest destruction.
- Using a 35mm camera (loaded with slide film) photograph magazine photos.
- Have students make audio-visual aids and formulate presentations around their issues, rehearsing whenever possible.
- Construct an information board illustrating various local grassroots organizations and campaigns to help interested students get involved.
- Work with other teachers to schedule a day when their classes will come in for the slide show presentations. Hollywood High organized their event around Earth Day.

For more help in putting together an environmental slide show contact:

Earth Endeavors
P.O. Box 6130
Torrance, CA 90504
(310) 535-2419

Adopt-a-School

or "Peer Partners in Environmental Education"

"In order to teach one must learn..."

Environmental education at an early age is perhaps the most effective way of developing a stronger environmental ethic in our society. "**Adopt-a-School**" works to instill this ethic in children during their impressionable years. Older students can have a strong influence on younger pupils who are sure to be a captive audience. This program builds upon that dynamic. What is more, the high school-aged teachers themselves learn by making presentations to their adopted elementary school classes. The older students come away with a sense of empowerment knowing that they have positively affected others.

Adopt-a-School uses environmental education as a bridge between older students and the younger ones. Middle and high school students act as mentors to younger students at local elementary schools, teaching them about a whole variety of global and local environmental issues. In order to teach, the older students must first understand the issues in-depth. So in the early stages they do research and learn from "eco experts" in the grassroots sector or at the university level.

There are many variations of *Adopt-a-School*. We have seen students that pick a different topic (i.e. endangered species, biodiversity issues, recycling, alternative energy and deforestation) for each month of the school year and make 1 or 2 presentations each month. Other students have opted for a less intensive program, picking a single issue and making just one or two presentations over a one month period.

We'll use the example from the video to illustrate how this program works. The students from Indian Heritage High School in Seattle were interested in the condition of the Duwamish River. They took field trips to the river to gather water samples which they tested back on campus in their science labs. To supplement this first-hand information they spoke to local officials and experts. They learned about the history of the river, it's current state, the sources of pollution and the causes of declines in salmon populations. With this knowledge, they created a story-like presentation, using visual aids to capture the attention of the young audience. They concluded with practical, easy-to-understand solutions like urging parents to use biodegradable cleaning solutions and informing them not to dump used motor oil in storm drains.

Students at Santa Monica High School tackled the topic of packaging and waste reduction. In their research students addressed several questions: How much energy and resources does it take to produce the packaging for our products? Where does trash go? How many pounds of trash does the average American contribute to the waste stream each year, and how can we minimize our impact as individuals? What are the alternatives to over packaging, and what are our choices as consumers?

In their presentation the students encouraged the audience to think about these questions, emphasizing that all our decisions impact the environment in

some way. To make their point, they used visual aids like a poster board illustrating the "zero-waste lunch" (reusable lunch bag, plastic juice bottle, cloth napkin and Tupperware container) as an alternative to a typical "trashy" disposable lunch. Examples of each were glued to the board which was placed in front of the class.

They also presented examples of over-packaged items, comparing them to packaging that is more ecologically sensitive. They showed how packaging is often used to make a product look better but ends up more harmful to the environment. The presenters gave practical solutions to the audience, encouraging them to shop smart and make environmentally conscious decisions.

Helpful Hints

• Contact local elementary schools to find out who will participate. Develop a presentation schedule and a method for evaluation.

• Offer a variety of topics for presenters to choose from keeping in mind the age and maturity level of your target audience.

• Arrange for officials and experts to come and speak to your students. Most often they will be eager to do this and it will provide an interesting balance to your students' own research.

• Contact a geography or environmental studies department at a local university or community college. You may find teachers or students who will mentor your student presenters.

• Have parents sign release forms so students may drive themselves to the elementary schools, or seek volunteers to transport students.

• Encourage students to look at different sides of an issue and to relate it to the lives of the elementary students. Offer tangible solutions.

For more information about *Adopt-a-School* contact:

The Center for Environmental Education
400 Columbus Avenue
Valhalla, NY 10595
(914) 747-8200

Resources:

<u>Peer Partners in Environmental Education Guidebook</u>

Available from the Center for Environmental Education for under $10, this 70-page guidebook contains step-by-step information, sample presentation outlines, prop suggestions and background information on topics.

Youth Environmental Summits (and EE Workshops)

"This is youth-initiated for the youth of the world..."

We have seen everything from small dual-class workshops to one day inter-school workshops to week long international youth summits. These gatherings empower youth by forming new relationships, creating valuable opportunities for learning and increasing the momentum in the youth environmental movement. What is more, a forum is created where project ideas like those included in this manual can be discussed and eventually implemented.

Helpful Hints (for any type of workshop)

• Create a theme or central focus for the workshop, such as "how to organize class projects around local environmental issues."

• Bring in representatives from agencies or grassroots organizations currently working on local projects. Have them speak to the group, focusing on how action-oriented projects can be started in class.

• Use ideas from The *Generation Earth* Companion Manual as a focal point of discussion. Think of new ideas and variations that you can start up.

• Create an "ideas" board to keep track of possible projects to develop around local issues.

• Students who are motivated and ready to start a project should develop a written proposal (a game plan) with goals, objectives, methods and a timeline.

For more help in organizing a summit or workshop contact:

Youth Environmental Summit Headquarters
Thompson Valley High School
1669 Eagle Drive
Loveland, CO 80537
(303) 593-0599

Student organizers at TVHS have compiled a manual based on their experiences coordinating the Global Youth Environmental Summit of 1995. Their summit was organized almost entirely by the students, so they are a great resource.

IV

More Help

Names, Numbers and Fundraising Ideas

Fundraising Activities

Human-i-Tees™ environmental T-shirt fund-raisers are an extremely popular and successful means of raising money for students of all ages. Their fund-raiser has provided a profitable and educational way to raise funds and environmental awareness for more than 1,000 school, youth and service organizations across the country. In addition, they donate 20% of their profits to groups working for the preservation of the Earth. This project is risk-free, takes very little time and virtually no organizing. Your group does not need to outlay any money, just take orders and your group keeps $3.50 for every shirt sold.
Human-i-Tees™, The Environmental T-Shirt Company
1 (800) 4 PLANET

Green Earth allows students to raise money by selling products that will pay for themselves quickly and save supporters money and water each year. Products include a household water conservation kit, recycle-a-soda-bottle bird feeder, eco-spouts, "E" magazine and others. There are no up front costs. Simply take orders and receive 35% commission.
Green Earth Fundraising Programs
1-800-880-1915

The **Earth Foundation** provides students with rain forest crunch cookies and T-shirts for school fund-raisers. Profits go to support the foundation's efforts in Africa, South and Central America and South East Asia to halt rain forest destruction. During the past 3 years, Earth Foundation has assisted in passing legislation to stop the logging of 1 million acres of forest in Honduras and convinced two major oil companies to cancel plans to drill for oil in the Amazon.
Earth Foundation
(713) 699-8010

Project Environment makes products available for fundraisers. Products include post-consumer waste recycled 3 ring notebooks, recycled note book pads, cellulose food bags, 100% cotton lunch bags and more. Call for more information.
Project Environment
(818) 591-3060

Greeting Card Sale: Sell 8 assorted "Peace Collection" greeting cards and envelopes at $10.00 per package. Retail value $14.80. For more information call:
Earth Jam Peace Collection Greeting Cards
(818) 771-5404

Center for Environmental Education

BLUEPRINT FOR A GREEN SCHOOL

Blueprint for a Green School, the first environmental education resource guidebook of its kind, offers invaluable information to K-12 students, educators, administrators and parents. This comprehensive manual outlines how to incorporate environmental lessons into schools at every level. **BFGS** addresses and provides resources in each of the following areas:

- Campus Health & Environmental Issues
- The Art & Science Rooms
- Curriculum/EE Materials Available
- Source Reduction & Recycling
- Student/Teacher Outreach
- Nutrition: You & the Environment
- Preschool/Daycare
- Pesticides & Toxics
- School Gardens
- Water & Energy
- How to Take Action
- Electromagnetic Pollution
- Resource lists include state agencies, curricula, videos, books, student groups & more!

The Center for Environmental Education is a resource center and lending library dedicated to environmental education. The Center provides curricula, videos, books, periodicals and many other resources including the free biannual newsletter Grapevine and the innovative Green School Program.

Why You Need This Book

As an educator, you can make a real difference in environmental awareness at your school. There is so much to learn about classroom materials and curricula, air quality, nutrition, energy use and much more. For example, children are far more vulnerable than adults to lead, pesticides, asbestos and toxic chemicals. **Blueprint for a Green School** puts reliable information at your fingertips. Hazardous substances are only a part of the coverage you'll find in this essential reference and teaching resource.

To order contact:

The Center for Environmental Education
400 Columbus Avenue
Valhalla NY, 10595
(914) 747-8200

National Environmental Education and Action Organizations

These are just a few of the many organizations out there.

Sierra Student Coalition (SSC)
Mark Fraioli
Box 2402
Providence, RI 02906
(401) 861-6012

Youth For Environmental Sanity (YES!)
Ocean Robbins
706 Frederick St.
Santa Cruz, CA 95065
(408) 459-9344

Student Environmental Action Coalition (SEAC)
P.O. Box 1168
Chapel Hill, NC 27514-1168
(919) 967-4600

Student Conservation Association, Inc. (SCA)
P. O. Box 550
Charlestown, NH 03603-0550
(603) 543-1700

Student Advocates For A Green Earth (S.A.G.E.)
Bay Area Action
Sue Nicholls
667 Marion Ave.
Palo Alto, CA 94301
(408) 447-2153

Caretakers of Environment International/USE
Isabel Abrams
2216 Schiller Avenue
Wilmette, IL 60091
(708) 251-8935

RIHOPE
(Rhode Island High Schools Organized to Protect the Environment)
Sarah Bobcock
42 Eames Street
Providence , RI 02906
(401) 789-3692

INTERACT
Thompson Valley High School
1669 Eagle Dr.
Loveland, CO 80537
(303) 669-0801

Human Environment Center (HEC)
1001 Connecticut Avenue, N.W. # 827
Washington, D.C. 20036
(202) 331-8387

International Clearinghouse on the Environment
1601 Connecticut Ave., NW
Washington, DC 20009
(202) 667-3291

Save The Rainforest
604 Jaime Street
Dodgeville, WI 53533
(608) 935-9435

Student Pugwash USA
1638 R Street, N.W., Suite 32
Washington, DC 20009
(202) 393-6555

YMCA Earth Service Corps.
Metrocenter YMCA
909 4th. Avenue
Seattle, WA 98104
(206) 382-5013

Environmental Action
6930 Carrroll Ave. Suite 600
Takoma Park, MD 20912
(301) 891-1100

Institute for Environmental Education
18554 Haskins Road
Chagrin Falls, OH 44023
(216) 464-1775

Center For Environmental Information
50 West Main Street
Rochester, NY 14607
(716) 262-2870

National Association for Humane and Environmental Education
67 Salem Road
East Haddam, CT 06423
(203)434-8666

Institute for Earth Education
P.O. Box 115
Greenville, WV 24945
(304) 832-6404

North American Association for Environmental Education
1255 23rd Street NW, Suite 400
Washington, DC 20037
(202) 467-8753

Rainforest Action Network
450 Sansome, Suite 700
San Francisco, CA 94111
(415) 398-4404

Earth Generation
P.O. Box 2005
Midland, MI 48641-2005
(517) 631-4010

National Consortium on Environmental Education and Training
SNRE University of Michigan
Ann Arbor, MI 48109-1115
(313) 998-6726

Center for Environmental Education
881 Alma Real Drive Suite 300
Pacific Palisades, CA 90272
(310) 454-4585

North American Environmental Education and Training Foundation
915 15th Street NW, Suite 200
Washington, DC 20005
(202) 628-8200

Alliance for Environmental Education
51 Main Street
P.O. Box 368
The Plains, VA 22171
(703) 335-1025

Envirolink Network
Suite 236 Hamburg Hall
5000 Forbes Ave.
Pittsburg, PA 15213

World Resources Institute
1709 New York Avenue NW
Washington, DC 20437
(202) 638-6300

World Wildlife Fund
1250 24th Street, NW
Washington, DC 20006
(202) 293-4800

Creating Our Future
398 North Ferndale
Mill Valley, CA 94941
(415) 841-3020

Environmental Defense Fund
257 Park Avenue South
New York, NY 10010
9212) 505-2100

National Toxics Campaign
29 Temple Place
5th floor
Boston, MA 02111
(617) 482-1477

Global Tomorrow Coalition
1325 G Street, NW Suite 915
Washington, DC 20005-4016
(202) 628-4016

Indigenous Environmental Network
P.O. Box 485
Bemidji, MN 56601
(218) 751-4967

Greenpeace, Inc.
1436 "U" Street, NW
Washington, DC 20009
(202) 462-1177

US PIRG
718 "D" Street SE
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