Metro Greenspaces 2000
Environmental Education and Enhancement Grant

FINAL REPORT
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Background:

The Washington State Mandate of 1990 calls for the integration of environmental education across the K-12 curriculum, but it was passed without funding. Local school districts have left on their own to determine the meaning and scope of the mandate and how to implement it. Clark County K-12 educators continue to need access to training opportunities, environmental curricula, community resources, educational materials, and technical and financial assistance. Furthermore, Clark County is a rapidly growing community. As environmental educators, we need to respond to the public demand for environmental information and to the human and environmental need for change in behaviors to protect natural resources and natural areas.

The Environmental Information Cooperative (EIC), a shared effort of six partners to encourage environmental stewardship and provide environmental information and education to the community of Clark County, Washington, has been providing environmental education and information services to the citizens of Clark County for nearly ten years. The City of Vancouver, Clark County, Clark Public Utilities, WSU Vancouver, WSU Cooperative Extension, and the SW Clean Air Agency comprise our partner members.

One of the EIC's major objectives includes providing public access to environmental information and education resources that support the state mandate for K-12 environmental education integration (WAC 180-50-115). During 2000, EIC worked with local environmental education providers to offer workshops for pre-service and in-service teachers, home-school teachers, youth leaders, resource specialists and environmental educators. Educators, community members and youth are also welcome to borrow videos, curricula and books from the EIC collection housed at the WSU-Vancouver library. The EIC became a Washington State Clock Hour provider in October of 2000 to assist the state in providing professional development opportunities in environmental education for teachers.

Summary of the Project:

With the assistance of this grant, the Environmental Information Cooperative provided K-12 teachers in Clark County, Washington, access to environmental education training opportunities to help them integrate environmental education into their curriculum and thus comply with the Washington State mandate of 1990 (Washington Administrative Code 180-50-115).

EIC staff developed, coordinated, and presented five core teacher-training workshops for K-12 teachers in Clark County, Washington. The following workshops were provided:

- Birds Go to School -- focused on wildlife protection and wildlife habitat protection and encouraged the development of school site wildlife habitats.

- Bugs Go to School -- encouraged the development of school site gardens that would also demonstrate integrated pest management, natural gardening, and water quality protection education.

- Care for Air - improved to include the establishment of air quality monitoring projects at middle and high school sites in Clark County and focuses on air quality management and issues.

- Trash 'n' Toxics -- improved to meet with Washington's school reform effort and focused on solid waste and household hazardous waste management. This workshop was presented to pre-service teachers at WSU.

- Worms Go to School -- focused on worm bin ecosystems and organic waste management. The workshop was improved to encourage the use of worm bin soil for use in erosion control and as a soil amendment on school sites.

- Aquatic Bugs Go To School - Because of the interest and need for a workshop focusing on macro-invertebrates, an additional workshop was developed that focused on the lifecycle of the local macroinvertebrates, particularly those associated with a healthy salmon habitat, and strategies for collecting and identifying insects in the field and in the classroom.

With the recent listing of the wild steelhead as an endangered and threatened species under the Endangered Species Act, the EIC included raising public awareness about declining fish populations and fish habitat to its list of educational issues to address. Care for Air, Trash n' Toxics and Worms Go To School were also enhanced to include the connection with salmon and fish recovery issues. To provide more content specific information, Bugs Go To School was broken into two workshops, Bugs Go To School Gardens and Aquatic Bugs Go To School.

Project Objectives: The EIC staff identified five primary objectives to include in each of the offered workshops. They included:

- Integrate the concepts of environmental education and the workshop concepts and content into theme-based units or traditional curriculum.
- Show how the introduced activities were aligned with the Washington State Essential Academic Learning Requirements.
- Provide access to information and education resources through EIC, WSU Vancouver Library, Water Resources Education Center, Metro Regional Parks and Greenspaces, public agencies, stewardship groups, and other community partnerships.
- Provide information, resources, and strategies that facilitated the development of relevant school site projects for the protection of urban natural areas.
- Include field trips relevant to the topics.

Project Goal:

The EIC hoped to reach, at the very least, 75 K-12 teachers in Clark County, Washington through five workshops, an average of 15 teachers in each workshop.

In actuality, during the course of this grant period (December 1, 2000 - June 1, 2001), the EIC was able to offer 17 workshops and reached a total of 251 teachers:

Workshop	# wksps presented	ttl # particpants:
Birds Go To School	2	37
Bugs Go To School	2	23
Care for Air	4	63
Trash 'n Toxics (PLT)	2	26
Worms Go To School	6	88
Aquatic Bugs Go To School	1	14

Workshop Objectives:

Specific objectives were identified for each of the five teacher workshops that were developed and offered:

Birds Go to School (for teachers in grades K-12)

Objectives:

- To learn about Pacific Northwest birds and birds common to our local area
- To learn about wildlife habitats
- To integrate the concepts of environmental education, wildlife protection, and wildlife habitat protection into theme-based units or traditional curriculum
- To facilitate the development of school site wildlife habitats
- To facilitate the implementation of school site NatureMapping activities

Bugs Go to School (for teachers in grades K-12)

Objectives:

- To learn about "good bugs" and "bad bugs" in lawn and garden ecosystems
- To learn about alternatives to toxic chemicals in pest management
- To learn about groundwater resources, flow, uses, and protection
- To connect the concepts of integrated pest management, natural gardening, and water quality protection
- To integrate the concepts of environmental education, integrated pest management, natural gardening, and water quality protection into theme-based units or traditional curriculum
- To facilitate the development of school site gardens that will demonstrate integrated pest management

Care for Air (for teachers in grades 4-12)

Objectives:

- To become familiar with air pollutants, their sources, and their health effects
- To learn how we as a society manage air quality
- To learn about alternatives in air quality management
- To integrate the concepts of environmental education and air quality management into theme-based units or traditional curriculum
- To become familiar with community resources
- To learn how air quality management issues are connected to salmon and fish recovery
- To facilitate the establishment of air quality monitoring projects at school sites

Trash 'n' Toxics/PLT (for teachers in grades K-12)

Objectives:

- To learn how we as a society manage waste
- To learn about alternatives in waste management
- To integrate the concepts of environmental education and waste management into theme-based units or traditional curriculum
- To learn how waste management issues are connected to salmon and fish recovery
- To facilitate the development of service learning projects related to waste reduction

Worms Go to School (for teachers in grades K-12)

Objectives:

- To understand the role of composting systems in reducing organic material in the waste stream and returning nutrients to the soil

- To integrate the concepts of environmental education and waste reduction into theme-based units or traditional curriculum
- To investigate the organisms and relationships in a worm bin ecosystem
- To learn how to set up and maintain an active vermicomposting system
- To learn how waste reduction issues are connected to salmon and fish recovery
- To facilitate the use of worm bin soil in the development and maintenance of a school site garden

Workshop Content:

Hands-On Training Activities

Each teacher-training workshop included, as part of its agenda, activities designed to have teachers practice what they were learning in the workshop. These hands-on activities gave teachers an opportunity to learn new activities for the classroom, actually do them with colleagues before duplicating them with students, sample a variety of activities for content and grade-level appropriateness, and then present these activities to each other in small groups during the workshops.

Content Specific Information

Birds Go To School

Thanks to environmental laws prohibiting the use of DDT, bird species that were once on the edge have rebounded. This may be an old environmental story, but it provides a positive context for young people living in rapidly growing Clark County facing issues related to habitat, hazardous waste, endangered species, clean air, energy and clean water. The Ridgefield National Wildlife Refuge defies the imagination in its abundance of birds from season to season. Participants enjoyed the new trails on the refuge and planned trips for their students using the teacher's guide to the refuge. The Vancouver Audubon's Bird Discovery Box, available for loan to teachers through the EIC, provides preparatory activities for the day's field experience. Bird experts and wildlife enthusiasts from the Backyard Bird Shop and the National Wildlife Federation's Schoolyard Habitat Program offered tips on the best ways to attract birds and other wildlife to school grounds. Participants received copies of the teacher' guide to the Ridgefield National Wildlife Refuge, Bird Discovery Box activities, and Project WILD's K-12 Activity Guide with includes excellent wildlife activities. This workshop provided a great opportunity to integrate environmental education into both social studies and science using research, hands-on activities and a field trip to one of Southwest Washington's treasured places.

Good Bugs Go To School Gardens

School gardens have traditionally served as outdoor classrooms all over the world, and what better way for students to discover the relationships between people, plants and insects. By learning natural gardening techniques, participants learned to design gardens with students that are free of pesticides and excess fertilizers that can harm water supplies and aquatic habitats. Resource materials included information from Clark County Environmental Service's Natural Gardening program that both nurture plants and children's' ideas about learning. The hands-on activities that were used demonstrated the interdisciplinary nature of studying good bugs in the garden and included a tour of a locally recognized natural garden. These resources will be especially useful for those assisting 5th – 12th grade students with service learning or exit projects or elementary teachers extending science concepts in the FOSS Insects or STC Plant Growth and Development kits.

Care for Air

What are the invisible reactions in our atmosphere that causes those hazy days of summer? How come ozone can come from car exhaust and protect people from ultraviolet radiation? Why is the study of weather so important to monitoring air pollution? What can be done to improve air quality? These and other questions were answered and teachers were provided copies of the *Environmental Resource Guide: Air Quality,* which contains 20 age appropriate activities and up-to date fact sheets on the most common causes of air pollution. The Southwest Clean Air Agency, which monitors the outdoor air quality for Clark County residents provided a computer kiosk, also available for loan to classrooms, that allows students to quiz themselves using a fun Jeopardy-style format. The activities reviewed in the workshop will provide excellent ideas for activity stations for elementary students - who are familiar with concepts in the FOSS Air and Weather or STS weather science kits, middle school students - collecting data and designing experiments, or high school students - interested in collecting or analyzing real time weather and air quality data on The Portland Horizons Project.

Trash n' Toxics

The *A-Way with Waste* curriculum, written and developed by the Washington Department of Ecology to present waste management concepts affecting land, air and water in the ecosystem, was the curriculum introduced at this workshop. Activities provided in the curriculum addressed environmental, economic and political issues and are designed to promote awareness and attitudes and actions to solve waste management problems at home, in school and in the community. It has over 70 activities field-tested by, and for, Washington teachers, but is well known nationwide for its excellent organization of environmental education activities. Teachers attending the workshop were provided the opportunity to check out kits through the EIC that contain materials for several of the activities. Teachers were given a copy of the curriculum which provides excellent background information, fact sheets and activities in 4 categories: Air Quality, Solid Waste, Waste and Water and Hazardous Waste. The workshop encouraged participants to test activities students can use to apply academic skills to real world situations and identify local agencies eager to help schools reduce waste.

Worms Go to School:

After creating a worm bin habitat for their classroom, participants learned how to care for an active worm bin as they studied worm anatomy, behavior, reproduction, and the benefits of vermicompost for plant growth. Worms can recycle their body weight in fruit and vegetable waste every day. Since food makes up about 25% of school waste by weight, caring for worms can both increase recycling and provide rich opportunities for environmental action. Each teacher received *Worms Eat Our Garbage: Classroom Activities for a Better Environment* which contains over 100 activities designed to help elementary and middle school students build skills in science, math, language arts and creative arts. Teachers were encouraged to use classroom worms bins all year to extend concepts students may study using science kits such as FOSS Animals 2 x 2, and STC Soil. Clark County Master Composter/Recycler Worms Go to School program staff and volunteers offer support to teachers by troubleshooting and caring for these classroom worm bins on an on-going basis. Master Composter/Recyclers are also available to give classroom presentations and schedule tours of their compost demonstration site.

Aquatic Bugs Go To School

At any time of year, streams and ponds teem with life. By collecting and observing macroinvertebrates, participants wade deeper into an understanding of the lifecycles of aquatic bugs, and became familiar with the species indicative of healthy fish habitat. Classroom and outdoor activities from *Pond and Stream Safari* were used to frame the day's collection, identification and

research. Participants had the opportunity to create aquatic bug collections and sampling equipment. The on-line water quality monitoring database created by WDFW and the Department of Ecology in 2000 is also featured. Because identification of aquatic bugs is taught using the structure and function of its characteristics, *Pond and Stream Safari* activities help emphasize concepts taught in the FOSS Structures of Life and STC Organisms science kits. The resources also benefit anyone monitoring local streams for water quality because the identification practice can help build anyone's confidence in the field.

Planning Timelines: The following information provides an outline of the timelines for the planning and implementation of this project:

Winter, 2000
EIC staff organized a planning team to help design the workshop content
EIC staff determined final workshop content, dates, and facilities
EIC staff developed new workshops, content info and other workshop enhancements
Worms Go to School workshop offered

Spring, 2000
Continue to develop and enhance workshops with planning team
Bugs Go to School, Birds Go to School, Worms Go to School, Trash n' Toxics/PLT, and Care for Air workshops offered

Summer, 2000
Continue to develop and enhance workshops with planning team
Worms Go to School offered for teachers Trash 'n' Toxics and Care for Air workshops presented to WSU Masters in Teaching students.

Fall, 2000
Worms Go to School, Bugs Go to School, Aquatic Bugs Go To School, Birds Go to School, and 2 Care for Air workshops offered, one for teachers and one for the WSU MIT Pre-service teachers

Winter, 2001
EIC staff determined workshop offerings, dates, and facilities
EIC staff continued to develop and enhance workshops with input and assistance from planning team
Worms Go to School workshop offered

Spring, 2001
EIC staff continued to develop and enhance workshops with input and assistance from planning team
Bugs Go to School, Birds Go to School, Worms Go to School, and Care for Air workshops offered
Grant Completion
Final Report

Transferability:

Our goal was to give teachers access to information, materials, resources, and training opportunities that would enable them to develop effective environmental education programs in their classrooms, in their schools, and in their neighborhoods. Teachers who participated in EIC workshops were encouraged to share any of the information, activities, resources, curricula, materials, strategies, and ideas that they received, with other teachers in their schools. It was also suggested that they duplicate workshop activities in their daily lesson plans, introduce students to community resources for senior projects and service learning projects, and refer students to the EIC library for research.

Teachers may also apply strategies they learned in workshops for the development of school-wide environmental programs. Teachers were reminded that successful and effective curriculum integration involves the entire school community -- administrators, teachers, students, parents, classified staff, businesses, and school neighbors.

We were encouraged to find that teachers leaving our workshops felt confident to try the activities and strategies with students in their classrooms. We hope that teachers will successfully integrate the environmental education activities and strategies into their regular curriculum. The workshops were designed with that primary goal in mind and emphasized integration in all content areas (for example, art, social studies, geography, math, science, English, etc.).

Teachers participating in EIC workshops have gone on to:

- set up a worm bin for food scraps,
- implement a school recycling program,
- establish an air quality test station,
- implement a water quality monitoring program for chemical analysis and biological inventories,
- establish a naturescape or native plant garden,
- build a nature trail along a creek or in a greenspace,
- restore a neighborhood greenspace,
- construct kits to promote alternative cleaning products,
- construct a wetlands, and other programs that involve students in environmental action projects.

Key Participants in Planning and Presentation of the Workshops:

EIC Partners:

City of Vancouver Public Works, Clark County Public Works, Clark Public Utilities, Southwest Clean Air Agency, WSU Cooperative Extension, and WSU Vancouver

All of these members are funding partners of the EIC and support EIC by providing a staff member to serve on the EIC Board, staff assistance in the development and implementation of workshops, volunteers for program assistance, and a facility in which to hold workshops.

WSU Vancouver also provides a space for two work stations, houses the library collection, and provides services for library cataloging and circulation, staff assistance for public access to the EIC library, technology services for email, computer maintenance, networking, and Internet access, and office services for photocopying, phones, mail, fax, and supplies.

Other Partners & Volunteers:

Educational Service District 112 and Clark County School Districts

EIC works cooperatively with ESD 112 offices and school districts within Clark County. With their cooperation, EIC coordinates workshop scheduling, teacher registration, clock hours credit, a substitute reimbursement program, and extension workshops for its science and mathematics training program.

Community Stewards

EIC cooperatively with volunteers and staff from Ridgefield Wildlife Refuge, National Wildlife Federation, Vancouver Audubon Society, Backyard Bird Shop, Sierra Club, NatureScaping Southwest Washington, WA St. Office of EE , and Watershed Stewards.

Evaluations:

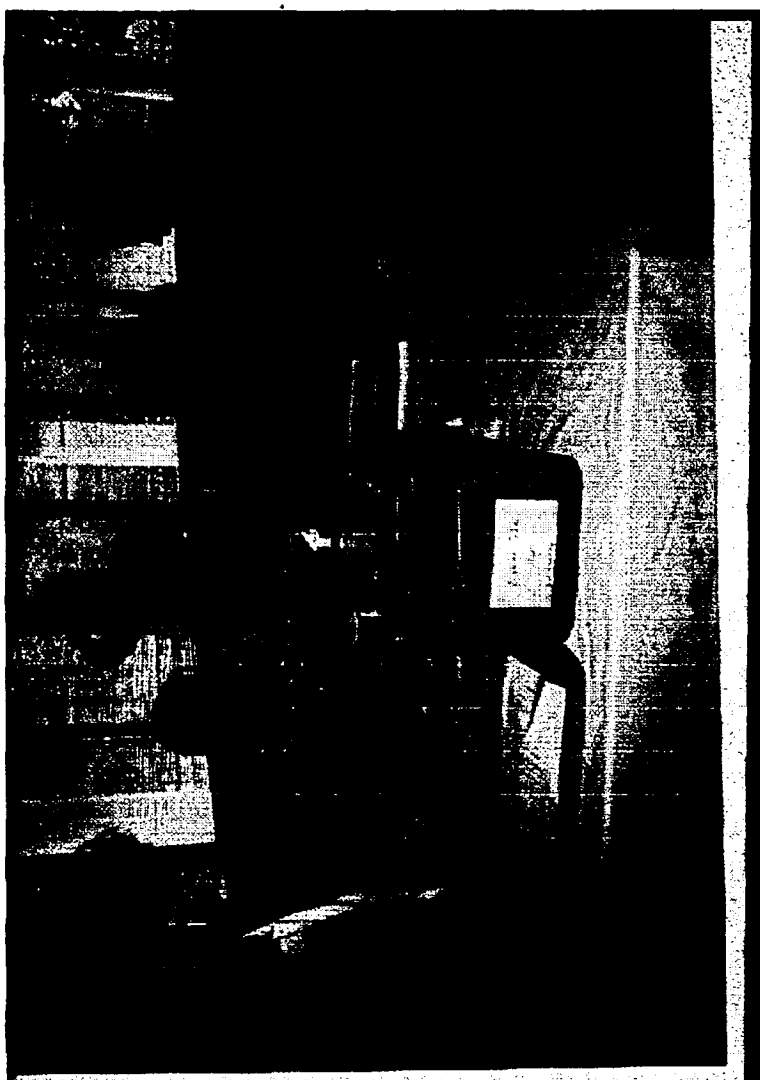
Typical of comments contained in workshop evaluations included, "This training was extremely beneficial – all presenters were very educated on the topic(s), also very helpful and the participatory, activities were great!" • "Wonderful! One of the best I've ever been to."

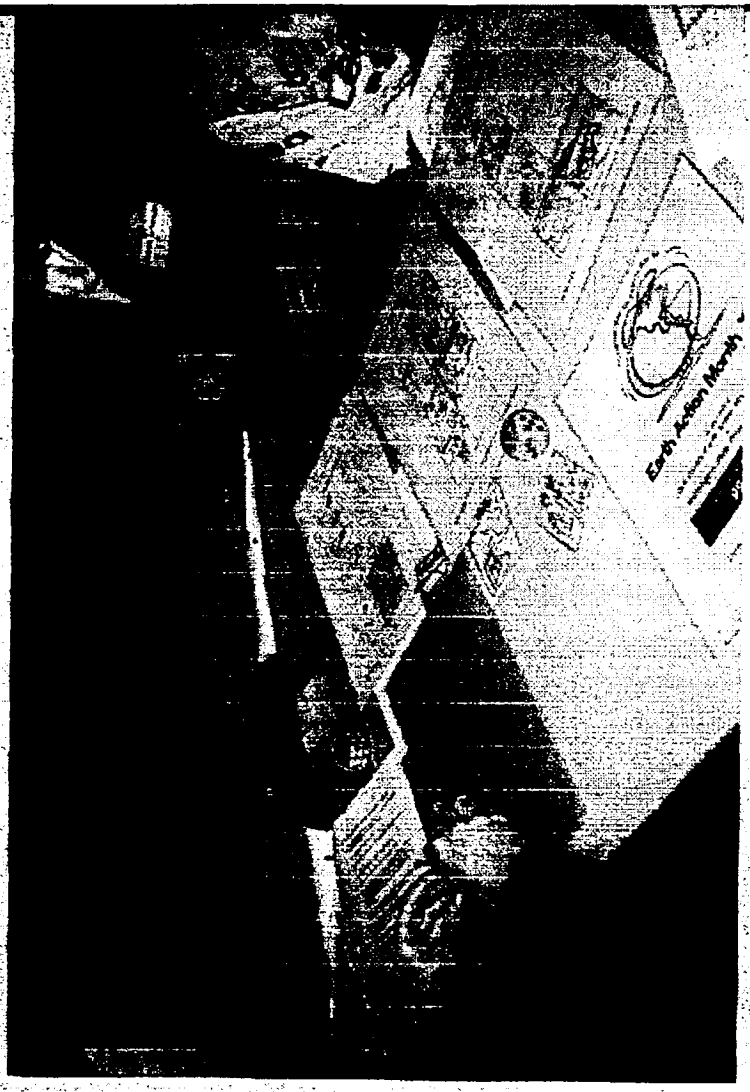
Challenges/Solutions: The following three issues proved to be the most challenging for this project:

- *Challenge: Promoting the workshops.* Solutions: 1) Working with Clark County to use the workshops as a tool for the schools to wave their new stormwater fees. 2) Having one-on-one discussions with curriculum specialists at each school about workshop content, relevancy and value.
- *Challenge: Limited number of substitute teachers available.* Solutions: 1) Contact the District substitute scheduler for best times and days to hold workshops. 2) Hold after school workshops. 3) Offer to pay curriculum development time and hold workshops on Saturdays.
- *Challenge: Limited funding in districts for professional development.* Solution: Reimburse districts for substitute reimbursements.

Next Steps: To continue to evaluate and offer the workshops, improve upon content and determine additional methods for promoting the workshops.

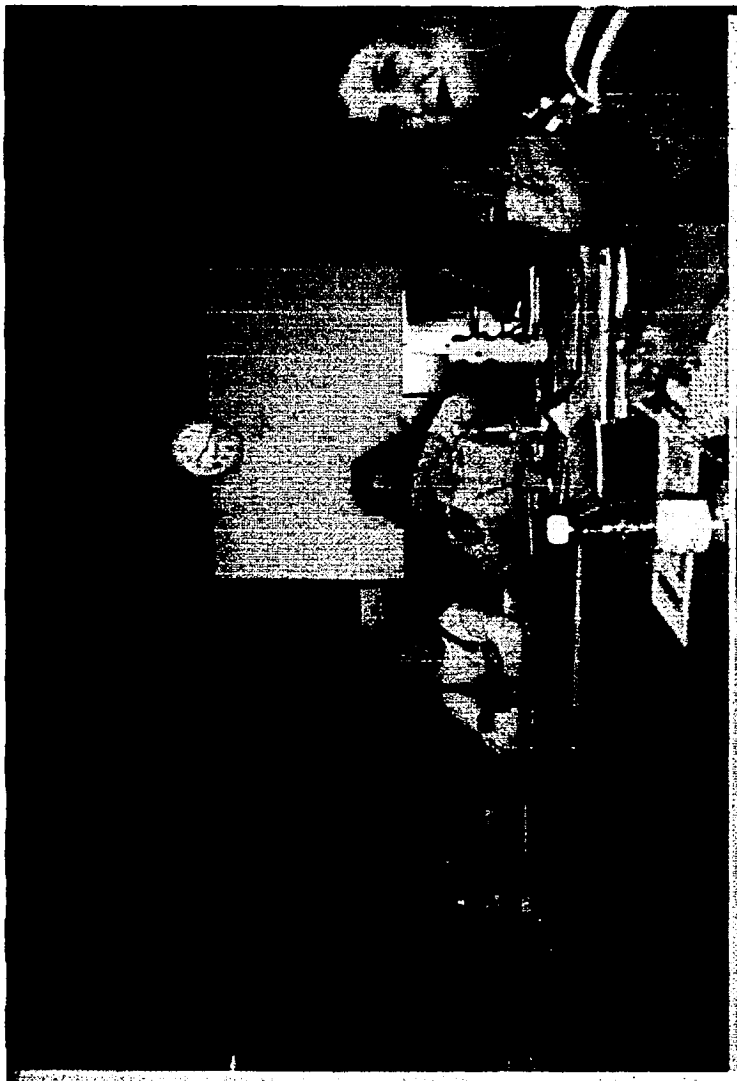
Future plans: EIC plans to continue offering the six workshops developed during this grant project. The EIC staff has developed a good working relationship with WSU faculty, specifically in the Library, Masters in Teaching and Natural Resources/Biology departments, resulting in assistance with laboratory and AV equipment, presentations at workshops by WSU staff and interns, and the development of Internship positions in the EIC. We plan to continue to build on these relationships, and encourage additional Internship positions and the development of new programs and projects.





TEACHER WKSHPS

HANDS-ON ACTIVITIES



TEACHER WKSHPS

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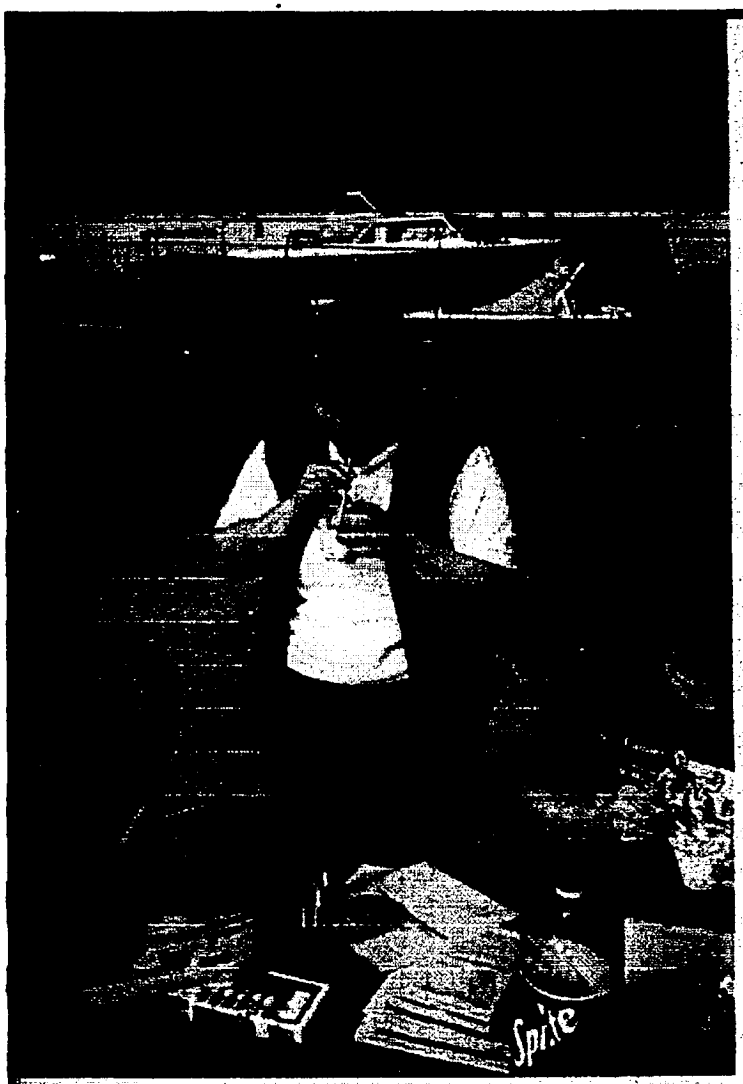

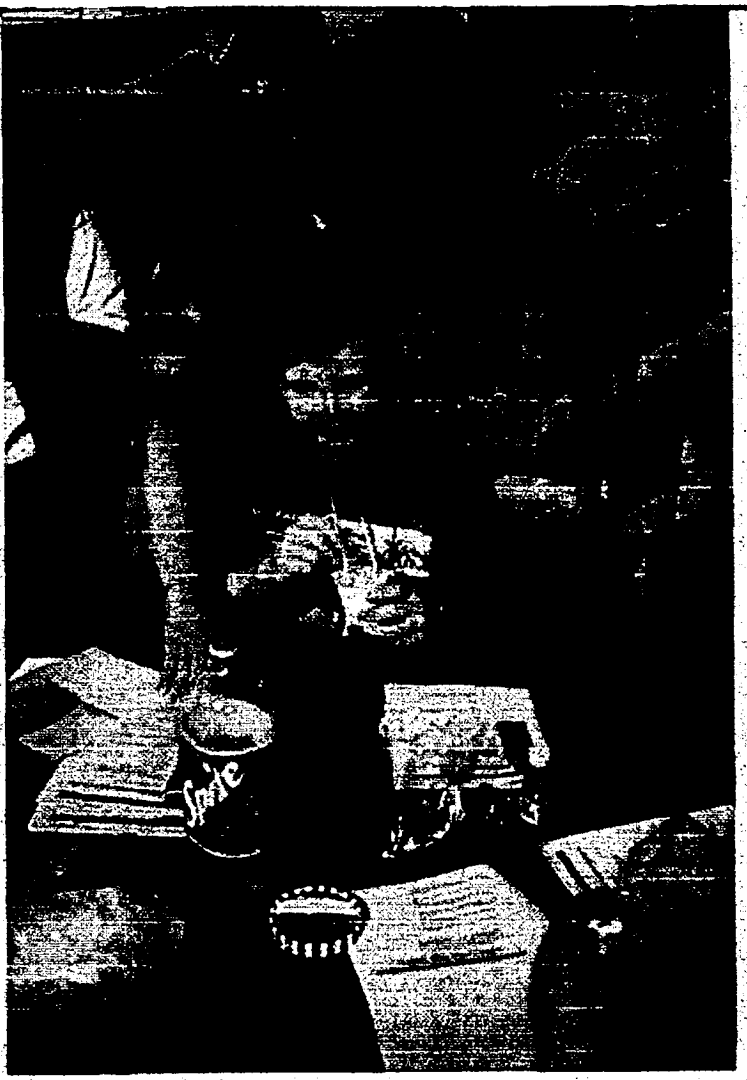

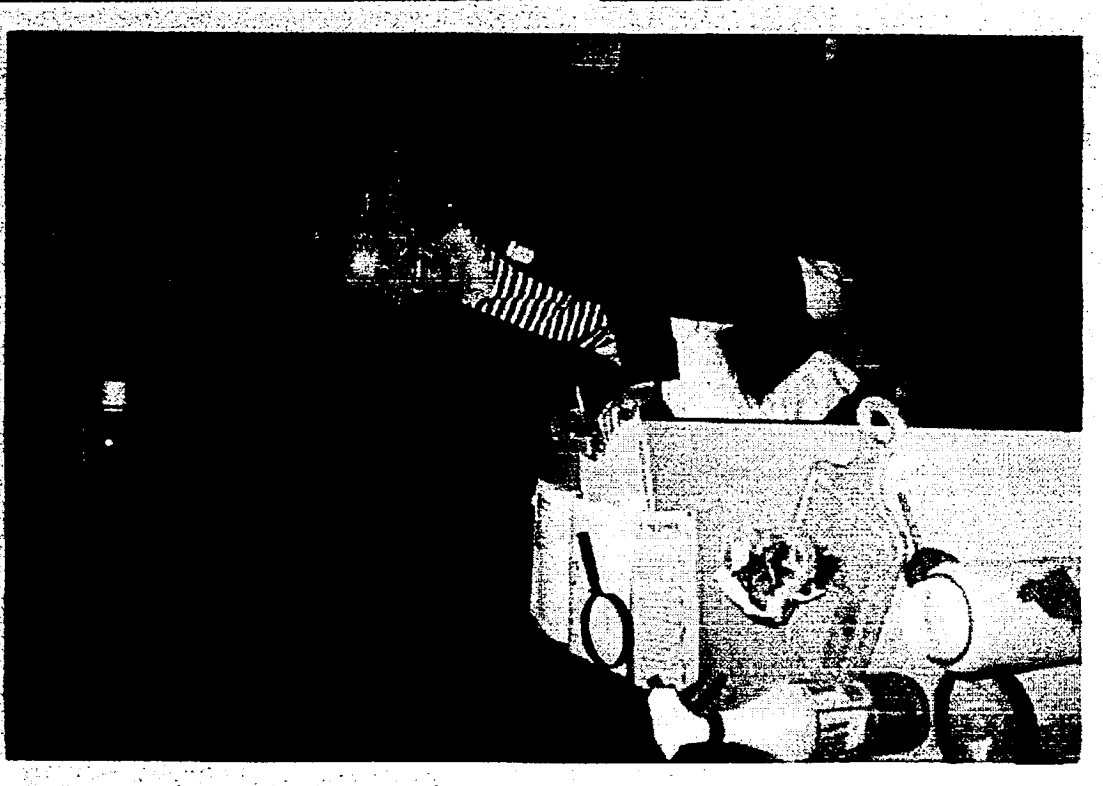

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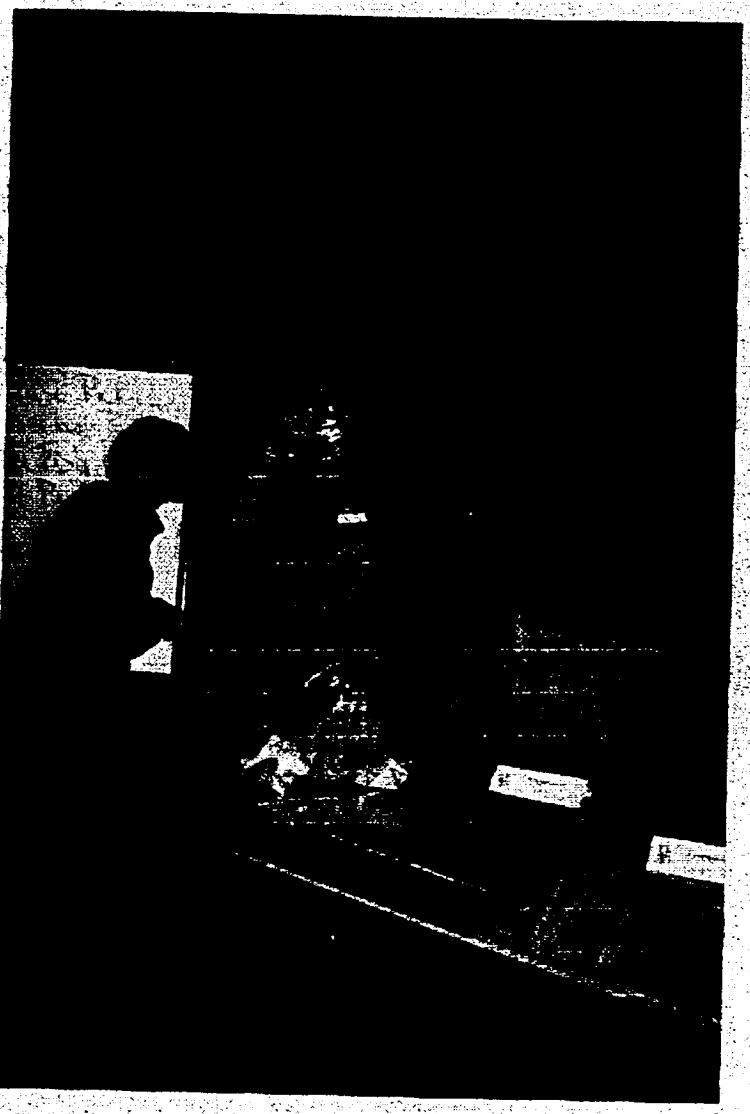

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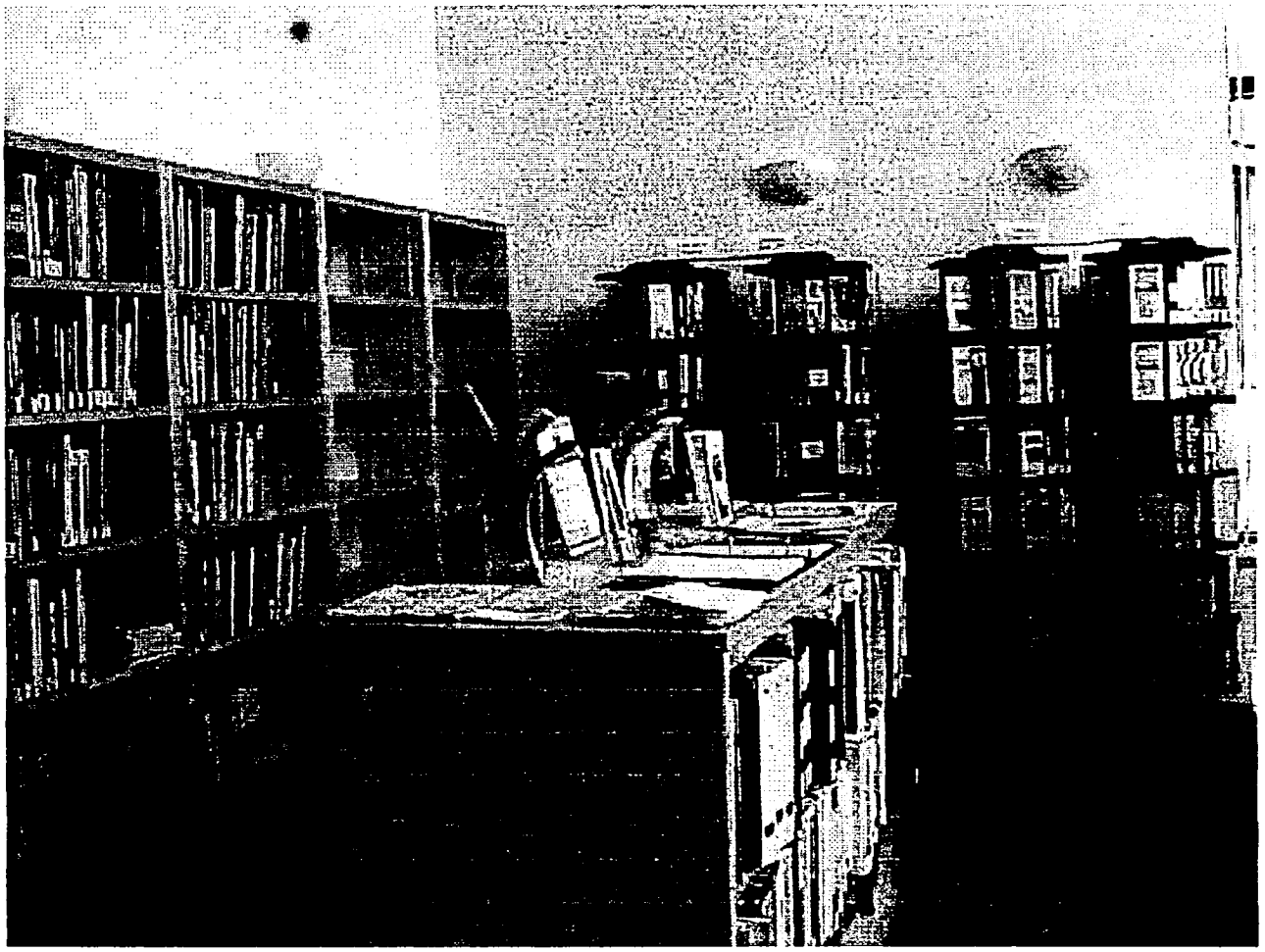
HANDS-ON ACTIVITIES

TEACHER TRNG
WKSHP



EIC RESOURCE
LIBRARY