

Earthteaching News

The Newsletter of the Earth Partnership for Schools Program

Winter 2002, Vol. 8, No. 1



Earth Partnership for Schools Receives Major Grant

The University of Wisconsin-Madison Arboretum and its Earth Partnership for Schools (EPS) program is one of 29 science museums, nature centers, aquariums, zoos and other informal science education centers sharing

\$12 million in new grants from the Howard Hughes Medical Institute (HHMI). The awards support programs nationwide that strengthen science literacy and enhance science education.

The enthusiasm, dedication, support, hard work and success of teachers, administrators, community members and students helped make a compelling case for continued support of EPS. Thank you! This grant has made it possible for us to continue providing quality education to students, teachers and schools and to develop and implement a 4-year plan to strengthen and expand EPS.

The grant will fund continuation and expansion of EPS, which offers kindergarten through grade 12 teacher professional development in habitat restoration and works with school communities to restore native landscapes on

school grounds that serve as outdoor classrooms.

As students design, plant, tend and study native ecosystems, their natural curiosity stimulates them to pose questions, make observations and learn through first-hand exploration. Teachers use the experience to develop a restoration-based curriculum drawing on all subjects, from science and math to language arts and social studies. Schools are encouraged to develop meaningful ways to partner with surrounding community members to support native habitat restoration and quality education.

Here are program highlights for the next four years:

Graduate Level Summer Institutes for Teachers:

This is an opportunity to gain an understanding of the ecological, cultural and historical elements of the restoration process through 80-hour summer institutes. Participants receive graduate credit, ongoing program support and a stipend. Ultimately, teams of teachers work together to develop a restoration-based curriculum and, with students and community members, they create outdoor living laboratories on or near their schools.

(Continued on page 2)

INSIDE . . .

2001 Summer Institutes.....p.3

**Sweeping Discoveries
(Activity).....p.4**

**Events and
Opportunities.....p.6**

**Inquiry Research
Projects..... p.7**

Mark Your Calendars.....p.7



Todd Miller, EPS staff member, and third graders from Fox Prairie Elementary, Stoughton, examine insects during EPS activity Sweeping Discoveries at Lake Kegonsa State Park (see related activity, p. 4).

Student Activities: Ongoing development of inquiry-based student research on school sites, development and distribution of inquiry kits to support student research, and regional field trips to ecological communities and restorations are some of the student opportunities available.

Biennial Student Research Conferences: In conjunction with the Arboretum's Native Landscaping Conference, these student conferences are a natural progression of the current research projects related to school site restorations. By providing an opportunity for students to share their research, EPS fills a critical niche — there are currently no other student conferences specific to restoration ecology. Such presentations are an integral part of inquiry-based learning.

Facilitating Centers: EPS forges meaningful links between students, teachers, schools, communities and the environment. To ensure long-term success, we are partnering with regional nature centers and other organizations in Wisconsin who serve as local resources for teachers and students restoring native habitats across the state.

Cooperating Center National Pilot: The Arboretum is collaborating with The Lady Bird Johnson Wildflower Center (Austin, Texas) to test the feasibility of offering the EPS program to schools nationwide. Wildflower Center staff and possibly a few Texas teachers will be attending summer institutes in Madison over the next four years.

Ongoing Alumni Support: Continuing Education Days covering relevant restoration ecology topics, an annual *Earthteaching News* newsletter, list-serve discussions, expansion of restoration-based educational opportunities on our Web site, and development of curriculum materials to meet state and national educational standards will be provided.

Prior funding from HHMI, along with funding from the Eisenhower Professional Development Program, have made it possible for EPS to work directly with 176 teachers and 10 community members from 49 schools in the past four years alone. We will continue to collaborate with teachers through ecological restoration-based institutes so that they can provide their students with the skills, knowledge and motivation to participate in a positive relationship with nature.

The Arboretum's Earth Partnership program began in 1991 as an outgrowth of the Arboretum's focus on ecological restoration and a way of establishing a positive relationship between people and the land. The Arboretum's world-famous pioneering restoration work, initiated by Aldo Leopold and his colleagues in the 1930s, provides living laboratories for restoration-related research and teaching. For more information, please call the Earth Partnership for Schools office at 608/262-9925, or check out our Web site at: wiscinfo.doit.wisc.edu/arboretum/earth_partnership_index.htm

Earth Partnership Statistics

- 150 - Number of EPS Schools
- 530 - Number of EPS Teachers
- 80 - Number of participating teachers in 2001 summer institutes
- 21 - Number of participating schools in 2001 institutes
- 19,000 - Number of student contacts participating in EPS activities during the 2000/2001 school year
- 35,000 - Total number of student contacts during the previous 4-year Howard Hughes Medical Institute grant cycle
- 105 - Number of EPS activities with Wisconsin state standards



These third grade students at Prairie View Elementary School in Oregon, WI, planned, designed and planted a wildlife woodland planting outside their classroom windows. Every grade level participates in restoration projects at Prairie View each year. Kindergarten classes germinate prairie seeds, first grade presses plants and create field guides for their schoolyard, second grade studies and plants trees and courtyard groundcovers, fourth grade selects prairie species for annual schoolwide prairie plantings. Students also map their school site, conduct site analysis and create art work.

2001 Summer Institutes

The big news at the Madison Summer Institute this past summer was using the Arboretum's new Visitor Center auditorium. Despite the sounds of stonecutters and wafts of asphalt curing on the drive, 46 teachers along with three community members are now prepared to return to school and begin restoration projects with students. You may ask, "Are these novice ecological restorationists really prepared?" Yes, as stated by one participant: "I feel like I can do anything in my classroom because I have done it and gone through the entire sequence. Seeing established prairies gave me the confidence and patience to see the vision."

Another said, "The staff and their in-depth knowledge is



A new feature of the Institute includes a Share Fair to "show and tell" what is happening at the schools. Here, Dawn Wood-Quast, Sparta Meadowview Middle School, is discussing a 6th grade prairie activity to Lori Erber, Beaver Dam Charter School.



Educational activities continue after the prairie is in the ground. Teachers are doing a Young Prairie Check-up to learn the composition of a new prairie. The inventory helps to assess the health of the planting.

an invaluable resource for those of us just starting out. The level of involvement was remarkable. I appreciate all the resources made available: consultants, binder of activities with text and Web resources and enthusiastic staff. Sometimes our skills, talents, and senses hibernate. This program has stimulated growth, development and skill, which we can pass on. I've taken many, many graduate courses – this institute excels beyond any that I have taken."

The final institute in a series sponsored by the Eisenhower Professional Development Program was held in northwestern Wisconsin in collaboration with UW-Stout and Standing Cedars Land Conservancy. Twenty-eight teachers and three community members

experienced EPS activities on the road while visiting wetlands, remnants and school prairies. Some of these schools are fortunate enough to have a remnant prairie within walking distance from school. What a way to study the model! As one participant stated, "It was exciting to walk through a remnant near a school and realize its potential for education both for the kids and the community."

Thanks to all of our enthusiastic participants and partners!



During the Institute, teachers participate in inquiry research projects. This inquiry team demonstrates how they used sweep nets to collect insects in Curtis Prairie.

Sweeping Discoveries

Activity Overview:

Students will collect and compare the numbers and types of insects found in a restored prairie with those found in a lawn.

Objectives:

- Use observation skills to collect and classify insects
- Compare and contrast insect populations in different ecosystems
- Compile, graph and share results, and pose questions for future research

Subjects Covered:

Science, Math, English Language Arts, Environmental Education

Grades: 4-12

Time:

1 class period to pilot sweepnetting and data collection
 1 class period to review ecological concepts and insect identification
 1 class period to conduct sweepnetting and data collection
 1 class period to analyze results
 1 class period to discuss and present results

Season: Late Spring, Summer, Early Fall

Materials Needed:

Sweep nets, sealable clear gallon plastic bags, insect identification field sheets (included) or insect field guides, data sheets (included), and magnifying glasses. *Note: EPS has an insect investigation kit that you are welcome to borrow, containing all of this equipment and more.*

State Standards Met: Science: C.4.5, F.4.4, B.8.6, C.8.3, C.8.9-11, C.12.3, F.12.8;
Math: A.4.3, A.8.4, B.12.1, C.12.1;
English Language Arts: C.4.1, B.8.1, F.8.1, C.12.1, E.12.1, F.12.1;
Environmental Education: A.4.4, A.8.5, A.12.5, B.8.3, B.8.8, B.12.7

Background:

Did you know that there are nearly a million known species of insects, and scientists estimate that there are between 1 and 29 million species waiting to be discovered? Did you know that dragonflies have 30,000 lenses in each eye and can fly at speeds of up to 35 miles an hour? Can you believe that a monarch can travel over 3,000 miles when migrating from North America to Mexico? Ants can lift and carry more than 50 times their own weight! To survive the cold of winter, many insects replace their body water with a chemical called glycerol, which acts as an “antifreeze” against the temperatures. These are just a few of the amazing things that insects do.

Insects play important roles in ecosystems from helpful predators to waste disposal engineers to soil fertilizers, to name a few. They’re also fairly easy to study on schoolgrounds. The following activity is based on a more extensive inquiry-based research project available to EPS schools (see p. 7).

Activity Description:

Assign teams of three or four students to a designated area in the prairie and in the lawn.

One student sweeps the net through the vegetation five times while walking in any direction. Quickly grab the net about one-third of the way from the bottom. Turn the third of the net with the insects inside-out, shaking it a little into a clear plastic bag held by another team member. Close the bag. *Do not handle individual insects.*

Each team records information about each of the first student's sweeps on a field sheet

- a) classify the insects to order (e.g., beetle, butterfly/moth) referring to the drawings on the Sweeping Discoveries Field Sheet
- b) record the number of individuals of each order in the boxes provided on the Sweeping Discoveries Field Sheet

Each student in each team takes a turn at sweepnetting. The team repeats the process of entering the data on the field sheet. After the last person has taken a turn sweeping and the data has been recorded, tally the total number of individual insects of each order that the team collected. Teams combine their results using the Sweeping Discoveries Tally Page for a class data set.

Results and Analysis:

- 1) Produce a graph that shows, side by side, the numbers of individuals in each insect order in the prairie restoration and the lawn.
- 2) Were any orders of insects present in only one habitat? Which species were common to both habitats? Can you think of possible reasons for this?
- 3) Which habitat is richer in insect species? Why might this be?
- 4) Did any new research questions occur to you?

Present Your Findings:

— To each other or another class using flip charts, overheads or PowerPoint.










Resources:

<http://www.colostate.edu/Depts/Entomology/links.html> – a directory of insect-related Web sites

Zim, H., Cottam, C. (1987) *Insects*. Golden Books. New York.

Please Note: Contact EPS to obtain a more detailed version of this datasheet for middle and high school students to describe and track distinct species.

Sweeping Discoveries Field Sheet Sweep # _____

 Dragonflies & Damselflies	 Butterflies & Moths	 True Bugs	 Wasps, Bees, Ants	 Beetles
 Grasshoppers & Crickets	 Flies	 Leafhoppers	 Spiders (not insects)	Other

Earth Partnership Program, UW-Madison Arboretum

Sweeping Discoveries - Tally Page

Record total # of insects in each category per team. Add the totals and record below.	Dragonflies & Damselflies	Butterflies & Moths	True Bugs	Wasps, Bees, Ants	Beetles	Grasshoppers & Crickets	Flies	Leafhoppers	Spiders (not insects)	Other
Team # 1										
Team # 2										
Team # 3										
Team # 4										
Team # 5										
TOTAL:										

Earth Partnership Program, UW-Madison Arboretum

Events & Opportunities

Student Research Conference

The Earth Partnership for Schools Program is organizing a student conference centered on the theme of ecological restoration to be held for one day in March of 2003. The purpose of this unique conference is to provide students engaged in various aspects of ecological restoration with a venue for sharing their knowledge and experiences with one another. The conference will likely contain a proposal process, oral presentations, a keynote speaker and a poster session. Other possible features include concurrent sessions by age and/or subject (e.g. science, language arts, fine arts), workshops, field trips, proceedings, and certificates. Please consider supporting your students' participation in this event. If you have organized something like this before, or have ideas of how to make your involvement more possible, we'd welcome your input. If you want ideas for research projects, see p. 7 "Inquiry Research Project Reviewers Requested" or contact Todd Miller, Research Outreach Specialist with Earth Partnership for Schools, at tfmille1@facstaff.wisc.edu or (608) 265-2539.

Purple Loosestrife on the Loose!

Does your school have any wetlands? Does it contain patches of plants that bloom from June to August with purple flowers? If so, your school site might be under siege by purple loosestrife (*Lythrum salicaria*), an aggressive, exotic plant. Scientists and land managers are experimenting with biological control to stop this invader. The Wisconsin DNR provides starter kits to landowners and teachers to rear and release Eurasian beetles that eat the leaves. This project offers students a hands-on opportunity to learn about invasive plants, biological control, wetland ecology and biodiversity. For more information, contact the WDNR's Brock Woods at (608) 221-6349 or at WoodsB@mail01.dnr.state.wi.us

UW Arboretum Native Landscaping Conference

This year's conference, entitled "Sustainability: Seeking an ECO- Balance," will be held at Madison's Alliant Energy Center on March 16 from 9 AM to 4 PM. New this year, students will share their research and learning experiences as a kick-off for student/teacher involvement in future conferences. Earth Partnership staff will teach about the messages school grounds send and how to design spaces to benefit both children and the ecology of the land. Other presentations include savanna ecology, restoration strategies for beginners, rain gardens, among others. Receive DPI clock equivalency hours for attending the conference. Go to wiscinfo.doit.wisc.edu/arboretum for a registration form and more information.

Equipment Kits Available for Loan

Classroom sets of ecological restoration equipment are now available to Earth Partnership schools! From insects and seed germination to soils and mapping, we have the tools to entice students to explore their school grounds. Sweepnets, insect guides, soil probes, compasses, trowels and field guides are just some of the materials available in these thematic kits. Call or e-mail Carol Edgerton at (608) 262-9925, caedgert@facstaff.wisc.edu to check out an equipment kit and arrange a time for pick-up.

2002 Earth Partnership Plant Sale on May 3-4

We're hosting our 7th annual plant sale for schools, providing high quality plants at affordable prices. Last year, 4,200 plants were sold to teachers and students from 19 schools. Would your students like species that bloom in the spring? We got 'em! Is the school restoration on a wet site? No problem! Take advantage of this once-a-year opportunity to engage students in selecting and planting native species for their restoration. Contact Plant Sale Coordinator, Michelle Milbauer, at (608) 262-2445 or mlmilbau@students.wisc.edu.

Looking to fund your restoration project?

Check out schoolgrants.org for up-to-date grant opportunity information. This Web site will save you time researching grant opportunities for elementary and secondary schools around the country. Locate federal, state or foundation grants, gain grant writing tips, view sample proposals, participate in discussion groups, and learn about fund-raising ideas and much more.



Inquiry Research Projects Reviewers Requested

EPS has four new draft research projects to promote restoration-based student inquiry! All projects contain state standards met, equipment lists, background material, activities, data sheets, assessments and plenty of food for thought. These projects can serve as model projects for later student-directed inquiry. Each project is written at a particular level (elementary, middle, or high school), but you are welcome to adapt them for your grade. Equipment kits that complement the projects are available to borrow (see p. 6 "Kits"). Contact Todd Miller at (608) 265-2539 or tfmille1@facstaff.wisc.edu if you would like a draft copy for review or more information. Below are summaries of each project:

Sweeping Discoveries

Did you know that three out of four animal species on Earth are insects and that they perform many invaluable ecological roles such as pollinators, predators and biological control agents (see p. 6 "Purple Loosestrife on the Loose")? They are also fun to watch and study. The project's question is,

"Do insect communities vary by habitat?" To answer, students use sweepnets to catch insects in different habitats such as a lawn and prairie. They fill out data sheets with the aid of a simple insect field guide and analyze the results. Are any species in both habitats? Which habitat is richer in insect species? Groups can graph and present their findings or pool their data together. This project guarantees to open you to a new world.

The Seed Treatment Experiment

Studying seed germination provides students with opportunities to observe one of the most dramatic changes in the life of a plant. Seeds of most plants go dormant until certain conditions such as temperature or light are met. This protects the seeds from germinating in the fall when there is insufficient time for the seedling to grow to survive the winter. In this project, students experiment to determine the conditions that result in the best germination rates for butterfly weed, ironweed or other prairie species. Appendices provide known effective treatments as a starting point. With a little creativity, your students may discover a treatment that adds to our knowledge of the species!

Plants Out of Place

Be on the alert! Invasive plants, such as leafy spurge and white sweet clover, can spread rapidly, usually crowding or shading out native plants. Invasive plants are a major threat to biodiversity. In this project, students become land managers and restoration ecologists as they design experiments to control invasive plants. Lists of curricula, as well as books, videos, and related Web sites are included.

Changing Patterns

Are all of the species planted in your school's restoration still present? Which plants are most abundant? Are some species more abundant in wet or dry years? Would your students like to collect data to answer these or other questions they have about their school's restoration? Do you want students to learn the scientific method through a challenging, outdoor investigation? If so, then this high-level project will walk students through the steps of making observations, formulating research questions, collecting data and making conclusions. The emphasis of this project is monitoring numbers of plants, but it can be used for animal studies, too.

Mark Your Calendars!

Date	Event	Location	Contact
March 16	UW-Madison Arboretum Native Landscaping Conference: Sustainability: Seeking an ECO-Balance	Alliant Energy Center Madison, WI	wiscinfo.doit.wisc.edu/arboretum (608) 263-7888
March 23	Prairie Enthusiasts Conference Tools for the Beginner: A Prairie Management Workshop	UW-Stout Menomonie, WI	www.theprairieenthusiasts.org/ conference/welcome.htm Barb Christie (414) 421-5928
April 11 - 13	WSST: Convention 2002	Monona Conference Center, Madison, WI	www.west.org/convention/
July 11 - 12	National School Gardening Symposium	Northwestern University Evanston, IL	www.chicago-botanic.org continuinged/schoolgarden.html
August 6 - 10	NAAEE Conference: The Boston TEE Party	Park Plaza Hotel Boston, MA	www.naaee.org
October 4 - 6	WAEE Fall Conference	Wisconsin Lions Camp Rosholt, WI	www.uwsp.edu/cnr/waee/Events /fallcon.htm

**The Earth Partnership for Schools Program
University of Wisconsin-Madison Arboretum
1207 Seminole Highway
Madison, WI 53711**

Nonprofit Org.
U.S. Postage
PAID
Permit No.658
Madison, WI

Earth Partnership Schools

Abundant Life Christian School
Amery Middle School
Amy Belle School, Colgate
Arena Elementary
Argyle High School
Arrowhead High School, Hartland
Beaver Dam Charter School
Belleville High School
Ben Franklin Elementary, Franklin
Black Earth Elementary
Bloomer Elementary
Boyceville High School
Brodhead Elementary
Butler Middle School, Waukesha
Calhoun Elementary, New Berlin
Cambridge Elementary
Central Middle School, Hartford
Chain O' Lakes Elementary, Waupaca
Cherokee Middle School, Madison
Chetek High School
Clarke Street School, Milwaukee
Cleveland Elementary, New Berlin
Colfax High School
Cottage Grove School
Country View Elementary, Verona
Crestwood Elementary, Madison
Daryl K. Lien Elementary, Amery
DeForest High School
DeForest Middle School
Denmark Elementary
Dickinson Elementary, DePere
Dresser Elementary
Edgerton Middle School
Edgewood High School, Madison
Einstein Middle School, Appleton
Ellsworth School District
Elm Lawn Elementary, Middleton

Elmwood Elementary, New Berlin
Fox Prairie Elementary, Stoughton
Frank Allis Elementary, Madison
Gaenslen School, Milwaukee
Glen Park Elementary, New Berlin
Glenwood City School District
Gompers Elementary, Madison
Hartford University School, Milwaukee
Hawthorne Elementary, Madison
Henry David Thoreau Elementary, Madison
Houlton Elementary School
Hudson Prairie Elementary, Hudson
Huegel Elementary, Madison
Humke Elementary, Nekoosa
Ixonia Elementary School
Ixonia High School
Jefferson Middle School, Madison
Kennedy Elementary, Madison
Kickapoo High School, Viola
Lake View Elementary, South Milwaukee
Lapham Elementary, Madison
Lincoln Elementary, Madison
Lodi Area Middle School
Luck High School
Malcolm Shabazz City High, Madison
Malcolm X Middle School, Milwaukee
Marshall Elementary, Marshall
Marshall Middle School, Janesville
Marshfield High School
Mendota Elementary, Madison
Menomonie High School
Middleton High School
Nekoosa High School
Netherwood Knoll Elementary, Oregon
New Berlin Center School
Nicolet High School, West Allis
North High School, Eau Claire
Northside Elementary, Middleton
Orchard Lane Elementary, New Berlin

Oregon Middle School
Patrick Marsh Middle School, Sun Prairie
Pepin Area Schools
Prairie Farm Middle School
Prairie View Elementary, Oregon
Prairie View Middle School, Sun Prairie
Prospect Hill Elementary, New Berlin
Riverside University High School, Milwaukee
Savanna Oak Middle School, Verona
Sennett Middle School, Madison
Sherman Middle School, Madison
South Milwaukee High School
Southwood Glen Elementary, Franklin
Sparta Meadowview Middle School
St. Croix Central Middle School, Hammond
St. Croix Falls School District
St. Mary's School, New Richmond
Stevens Point Parochial School District
Stoner Prairie Elementary, Verona
Sugar Creek Elementary, Verona

Sunset Ridge Elementary, Middleton
Taylor Prairie Elementary, Cottage Grove
Tiffany Creek Elementary, Boyceville
Toki Middle School, Madison
Trowbridge Elementary, Milwaukee
Verona Area High School
Vesper Elementary
Washington Elementary, Stevens Point
Watertown High School
Waukesha North High School
Waukesha West High School
Whitehorse Middle School, Madison
Windsor Elementary, Windsor
Wingra School, Madison
Wisconsin Academy of Adaptive Learning, Madison
Wisconsin Dells High School
Wisconsin Rapids School District
Wisconsin School for the Deaf, Delavan

For more information or our instructional materials list contact:

(608) 262-9925

Web site at: wiscinfo.doit.wisc.edu/arboretum/earth_partnership_index.htm

Earth Partnership Staff: Cheryl Bauer,
Carol Edgerton, Libby McCann,
Todd Miller, and Molly Fifield Murray.

This project was supported in part
by the

Howard Hughes Medical Institute

and the

Eisenhower Professional Development Program

