What if you were able to combine the “wow, that’s cool!” of a trip to the St. Louis Zoo with an inquiry activity that reinforces the Show-Me Standards? Imagine your students studying differences in biomes at the Missouri Botanical Gardens, then returning to the classroom to analyze their data. Or suppose students learning about their senses could apply their new knowledge as they experiment with displays at the St. Louis Science Center.

Science Outreach staff and faculty at Washington University are speculating that these powerful combinations of experiences will have a lasting impact on student learning. And thanks to a new $896,000 grant from the National Institutes of Health, Science Outreach will coordinate efforts to combine the best knowledge about teaching science in grades 5-12 among educators, university faculty and researchers at St. Louis’ nationally-known informal science institutions.

Victoria May, director of Science Outreach, and David Kirk, professor of biology, developed the proposal in spring 2000 with faculty from Arts & Sciences and the School of Medicine; and staff from the Missouri Botanical Gardens, St. Louis Science Center and the St. Louis Zoo. NIH approved the project, “A Partnership Linking Formal and Informal Education,” for a three-year period beginning Oct. 1. “This is an exciting new project, and I’m looking forward to collaborating with the group,” says Kirk.

The award begins a unique partnership that has the possibility of developing groundbreaking curriculum materials. “This is the only grant nationally that has this kind of collaboration,” says May. “We hope to combine the experience of teachers and the knowledge of people who do research in these fields to come up with curriculum that’s feasible,” she adds. “We want to integrate a narrative framework with inquiry-based lab activities, and combine the ‘gee whiz’ of going to an informal science institution with the classroom experience.”

The grant provides for curriculum development teams to design eight units based on topics that relate to the National Science Education and Missouri Show-Me Standards. The proposed topics and partnering institutions are:

**St. Louis Science Center topics**
1. Genetics and Human Affairs
2. These Feet Were Made for Walking
3. Pathways to Perception and Misperception
4. Foods, Fads, Fat and Fitness

**St. Louis Zoo topics**
5. Animal Behavior and Social Interactions
6. Leapin’ Lizards and Flying Dinosaurs (adaptations)

**Missouri Botanical Gardens topics**
7. Contrasting Biomes: Tropical vs. Temperate Forests
8. Human Impact on Ecosystems

During the 2000-01 academic year, three development teams will create draft units on topics 3, 5 and 7. The teams will consist of Kirk; May; an evaluator; a Science Outreach program coordinator; a WU faculty member to provide expertise in their research field; an educational staff member from the partnering institution; and a WU graduate student to provide web site support through the Mad Scientist Network (www.madsci.org). Key members of each team will be two teachers, one middle school and one high school, to help write curriculum, advise on educational strategies and suggest classroom methods for pilot testing. These groups will also play key roles in the pilot workshops, presented at the Science Center, Zoo and Botanical Gardens during summer 2001.

Science Outreach will be eligible for a second three-year grant for a similar amount in 2003 to adapt and disseminate the units nationally. The renewal award will also allow evaluators to collect and analyze more longitudinal data regarding classroom success with different populations, including urban, suburban, rural and underserved populations.

Science Outreach is currently seeking middle and high school teachers to serve on the unit development teams. Curriculum developers will be paid and credited as writers on the unit. If you are interested in being on the development teams for the perception (sensory biology) unit, the animal behavior unit or the contrasting biomes unit, please send a cover letter indicating the topic you are interested in, your resume and a letter of recommendation to Victoria May, Science Outreach, Washington University, One Brookings Drive, Campus Box 1137, St. Louis, MO 63130, by Jan. 12, 2001.
Plants and animals are natural additions to K-8 classrooms. Learn how to use them to introduce your students to the science of life. Students can develop strong foundations in science and a lasting interest in biology through curriculum from Edu 6004 Hands-On Science K-8: Biological Form and Function.

Topics and inquiry activities include:
• Plant and animal classification: gardens, pond life, rotting logs, seashore debris
• Biosphere globes in the classroom:
  • observing a closed system
  • Life is cellular: onions, sprouting seeds, tadpoles
  • Brain and nervous system: our senses, language, memory, pattern recognition
  • Respiratory and circulatory systems
  • Food and the digestive system
  • Structure and movement: bones and muscle
  • Plant structure: dissection of monocots and dicots
  • Power plants: photosynthesis and respiration
  • Microbiology

S P R I N G  2 0 0 1  C L A S S E S  I N  S C I E N C E  E D U C A T I O N:
Edu 6004 Hands-On Science K-8: Biological Form and Function

Passion Bragg, Riverview Gardens Central Middle School, and Wendy Ludwig, Brentwood Middle School, test water in Edu 6004.

Dates and location
Tuesdays, Jan. 16-May 8, 2001, 4:30-7 p.m.; Life Sciences 118

Instructors
Jack Diani, lecturer in biology/animal facilities manager; Mark Kalk, Science Outreach program coordinator; Sally Koczan, 5th grade teacher, Flynn Park Elementary School

Credits/fees
Students receive three graduate credits in education. Registration/tuition is $200, which will be collected the first class day. (This reduction from the standard WU University College price of $810 is made possible by funding from Howard Hughes Medical Institute Undergraduate Biological Sciences Education Program.)

Materials
Teachers who enroll in the course receive glass biosphere globes, books and other materials free of charge. Teachers who complete both Edu 6004 and Edu 6002 (Hands-On Science K-8: Life Cycles and Heredity) receive a Brock 20X microscope.

Information
For more information, call Elaine Alexander, program coordinator, (314) 935-7170 or e-mail elaine@biology.wustl.edu.

SPRING 2001 COURSE REGISTRATION
Please enroll me in the following spring 2001 science education course (check one):
☐ Edu 6004 Hands-On Science K-8: Biological Form and Function
☐ Bio 4191 Ecology Field Course for High School Biology Teachers

Name __________________________________________________ Address ________________________________________________
City ______________________________________ State _______________________________ Zip _______________________
Home phone ____________________________________________ Work phone ____________________________________________
School ______________________________________ District ____________________________ Grade __________

Send to: Elaine Alexander, Washington University, One Brookings Drive, Department of Biology-CB 1137, St. Louis, MO 63130.
SPRING 2001 CLASSES IN SCIENCE EDUCATION:

Bio 4191 Field Ecology for High School Biology Teachers

Join aquatic ecologist Phyllis Balcerzak for a series of biology lab and field experiences in early spring 2001. The course meets for five Saturdays in various locations, including urban, suburban and rural ecosystems. Earn two graduate credits as you learn how to take your biology class outdoors for standards-based explorations. Previous course participants Laura Montgomery of Francis Howell North High School and Tom Kazanecki of Parkway Central High School have field-tested the labs and worked with Balcerzak on refinements to the curriculum materials, so the activities are classroom-ready. Class size is limited, and preference will be given to those concurrently enrolled in the ecology lecture course (see below).

Course and curriculum include:
- Laboratory and field research investigative approaches
- Chemical and biological indicators of water quality
- Diversity of life in Forest Park ponds
- Effect of different fertilizers on plant growth
- Lab activities demonstrating competition and natural selection
- Computer simulations of changing ecosystems
- Effect of human activity on natural environments
- Computer simulations of ecological problems

Dates and location
The first class will meet in Rebstock 126 on April 7, 2001, from 9 a.m.-4 p.m. The additional classes meet at various field locations, April 21, April 28, May 12 and May 19.

Instructor
Phyllis Balcerzak, Ph.D., instructor in aquatic ecology and education

Credits/fees
University College will provide two graduate credits in biology to course participants for a registration fee of $50 (collected the first class day). Tuition is waived due to funding from the Missouri Coordinating Board for Higher Education.

Materials
Participants will be eligible to check out various kits, including water quality testers and plankton collection materials.

Information
Call Gary Corbin, Modern Genetics program coordinator, (314) 935-8138, or e-mail corbin@biology.wustl.edu, for more information.

LECTURE COURSE:

Bio 414 Principles of Ecology

Earn three graduate credits in biology through this survey of ecological principles underlying spatial and temporal distribution of animal and plant populations and biological communities. The course meets Mondays from 6-8:30 p.m. in Life Sciences 202 beginning Jan. 22, 2001. The instructor is Jason Bradford. Science teachers are eligible for a discount from the regular tuition of $1,395; call University College at (314) 935-6727 to learn more information and to register for the course.
NEW: Science Outreach online

Next time you’re seeking science education resources online, point your browser to www.nslc.wustl.edu/science_outreach/index.html. You’ll find Science Outreach’s new website, which includes:

• Information about SO course offerings for K-12 teachers
• Downloadable sample curriculum materials
• Back issues of this newsletter
• Teaching Teams information and sign up
• A form to update your contact information
• Contact information for SO staff

Expansion plans include adding interactive pages, such as bulletin boards, data collection forms and class sign-ups. The site went online in August. Victoria May, Mike Wirtz, Tom Elgin and Ethan Thiel collaborated on the content, design and HTML coding.

NSTA 2001 national convention in St. Louis:
A SCIENCE ODYSSEY

National Science Teachers Association conventions are terrific opportunities for professional development—especially when you don’t have to travel. The NSTA 2001 national convention is in St. Louis, March 22-25. Astronaut Buzz Aldrin is the featured general session speaker. In addition to Aldrin, dozens of featured speakers, several short courses and hundreds of sessions are planned around this year’s strands: technology, inquiry learning, research and trends in professional development, and elementary science literacy.

St. Louis science educators may volunteer as hosts and convention workers, and earn registration discounts. Two opportunities currently available are:

• Teachers and students may volunteer as convention guides. E-mail Larry Russell, lpdrussell@yahoo.com, for more information.
• Volunteer eight hours at the convention registration desk and receive a 50 percent discount on your registration fee; volunteer 16 hours and receive free registration! Workers are especially needed March 21-22, but four-hour shifts are available for all convention days. Send your name, address, phone, e-mail, preferred dates, morning or afternoon preference and total hours requested to: Pam Stanko, Assessment Division, Illinois State Board of Education, 100 N. First St., Springfield, IL 62777, fax (217) 782-6097 or e-mail pstanko@isbe.net.

Watch your mail for the advance program from NSTA in December. If you do not receive it, or if you have any questions about additional volunteer opportunities at the convention, please contact Amy O’Brien, administrative coordinator, (314) 935-6846, ext. 2, or obrien@biology2.wustl.edu.

BIOLOGY LECTURE SERIES:
Evolution to forensics,
March 8

Ursula Goodenough, professor of biology and author of “The Sacred Depths of Nature,” spoke to a group of about 20 biology teachers on Nov. 16. She suggested a narrative approach to teaching evolution because she believes that kids often lose interest in science when they only hear the facts, and not the story behind them.

Goodenough also recommended a storytelling method when addressing creationists’ concerns.

“We relate to each other through stories,” said Goodenough, who used slides to illustrate her points. Afterward, teachers gave a critique of Goodenough’s strategies and talked about their experiences teaching evolution.

The next lecture in our series for life science and biology teachers will be March 8 at the St. Louis Science Center, rooms A, B and C. The meeting will begin at 4:30 p.m.; the talk will start at 5 p.m. Mary Hamilton, a forensics investigator with the City of St. Louis Police Department, will speak on forensics and DNA evidence. If you are interested in attending, mark your calendar now and RSVP to Gary Corbin, Modern Genetics program coordinator, (314) 935-8138 or corbin@biology.wustl.edu.
Teaching Teams ’00-01

Teaching Teams have made close to 40 visits to St. Louis area classrooms this fall, bringing hands-on science activities to students in grades K-12. The 35 undergraduate team members work in groups, and make two classroom visits about a week apart. Teams that are still available to visit your classroom during the spring semester are:

- Chemistry (grades 4-8)
- Dissection (grades 2-8)
- Heart smart (grades 2-8)
- Physics (grades 4-8)
- This is your brain (grades 2-8)
- Plant propagation (grades 4-8)
- Simple genetics (grades 4-8)

To learn more about each team, visit our website at www.nlsc.wustl.edu/science_outreach/teams/index.html. To schedule a visit from one of the Teaching Teams, call or e-mail Elaine Alexander, program coordinator, (314) 935-7170 or elaine@biology.wustl.edu.

WU senior Stephanie Eucker explains capacitors and resistors to students in Tracy Winslade’s class at North Glendale Elementary School, in fall 2000.

It’s not all lab work: Students in the Prefreshmen program live on campus, and enjoy St. Louis summer social and recreational activities. Above, summer 2000 prefreshmen relax on the Meramec River.

STUDENT OPPORTUNITIES FOR 2001:

Summer Focus and Prefreshmen programs

TO TEACHERS OF JUNIORS IN ST. LOUIS PUBLIC SCHOOLS: The Summer Focus Program provides an opportunity for SLPS juniors going into their senior year in high school to do mentored research in a WU lab for eight weeks during the summer. Applications are due Jan. 12, 2001. If you would like to nominate one of your students, call Jennifer Mosher at (314) 747-0843 or e-mail mosherrj@dbbs.wustl.edu, and she will be happy to send you an application. The Summer Focus Program is sponsored by the Young Scientist Program and the Office of Diversity Programs at WU School of Medicine.

TO TEACHERS OF SENIORS: The Prefreshmen Summer Scholars in Biology and Biomedical Science program, for seniors applying to attend WU, takes place during seven weeks this summer, June 13-July 28, 2001. It allows 18-20 of our most outstanding incoming college freshmen to do research with a mentor professor, either on the Hilltop Campus or at the School of Medicine. Application forms are in the WU Scholarship Booklet; a brochure describing the program may be obtained from Elaine Alexander. Call (314) 935-7170 or e-mail elaine@biology.wustl.edu. Applications for this program are due Jan. 15, 2001.

THANKS TO THESE INDIVIDUALS who gave their time to the prefreshmen program and seminars in 2000!

Prefreshmen program mentors: Dr. Judith Ogilvie, Dr. Rainer Brachmann, Dr. Kevin Black, Dr. Tamara Doering, Dr. Tanya Wolff, Dr. Michael Neff, Dr. Dwayne Simmons, Dr. Alison Goate, Dr. Scott Saunders, Dr. Danny Kohl, Dr. Brian Hackett, Dr. Daniel Link, Dr. Virginia Miller, Dr. Jay Heinecke, Dr. Keith Hruska, Dr. Kristen Kroll, Dr. Kevin Roth, and Dr. Katherine Ponder.

Prefreshmen seminar speakers: Dr. Paul Stein, Dr. Barbara Schaal, Dr. David Kirk, Dr. Ursula Goodenough, Dean Sharon Stahl, Dr. Eric Richards, Ruth Lewis, Dr. David Ho, Dr. Frank Yin and Dr. Sarah Elgin.
New Science Outreach staff in the lab, from left: Amy O’Brien, Mark Kalk and Dana Benedicktus

New staff joins Science Outreach in fall ’00

Science Outreach welcomed three new staff members this fall: Mark Kalk, program coordinator, Amy O’Brien, administrative coordinator, and Dana Benedicktus, grants coordinator. Mike Wirtz, communication and graphics coordinator, has taken a position at a local newspaper, the “Vital Voice,” but he will continue to do graphics for SO on a freelance basis.

Kalk joined Science Outreach with the move of the Science Education Resource Center from its location near the Botanical Gardens, consolidating operations with WU Science Outreach. He coordinates the Urban Systemic Initiative programs in the St. Louis Public Schools, designs curriculum, teaches in our Edu 6000 program, and supports programs in biotechnology and microbiology. Kalk has a master of science degree in environmental science from Southern Illinois University-Edwardsville, and has been working in science education since 1990. Kalk is a mayoral appointee to the St. Louis-Jefferson Solid Waste Disposal Committee and is a board member for the Wild Bird Rehabilitation Clinic. He also volunteers his services to a number of local HIV and human rights groups.

O’Brien works closely with Victoria May, director, on a part-time basis. She’s in the office Mondays, Tuesdays and Thursdays. O’Brien coordinates the editing process for curriculum projects, keeps people informed about meeting schedules, manages the database and performs many other helpful and essential duties.

Benedicktus has worked with May and program coordinators Kalk and Gary Corbin, since 1991 when she was on the staff at MSEC. She has worked in marketing for Cooperating School Districts and most recently was assistant director of public relations for Fontbonne College. At Science Outreach, Benedicktus edits this newsletter, writes grants, does curriculum graphics and other communications projects. In her free time, she does aerobics, camps, hikes and bikes and does freelance writing and graphics.
At neighboring school district University City, 10 years of collaboration with its neighbors at WU Science Outreach has created an informal partnership benefiting both WU and U. City teachers and students. Starting at the kindergarten level, teachers have used curriculum materials developed by U. City teachers with SO input to help teach basic science concepts to the youngest children. Students at University City High School learn about DNA and biotechnology through activities from “Modern Genetics for All Students,” a curriculum unit developed and tested at UCHS, which is now in use throughout the St. Louis area.

Sally Koczan, a grade 4-5 teacher at Flynn Park Elementary School, has been involved in the SO-U. City partnership as both a student and instructor in Edu 6000 courses. “Primarily, the partnership gives a lot of elementary teachers the science background they need,” she explains. “Edu 6000 instructors present topics and bring hands-on stuff, so we can learn it before we teach it to kids. … I feel like I have colleagues at Wash. U.,” she continues. “Any problem I have, I know I can call and ask for help. It’s a good feeling, like having a safety net.”

The partnership began in 1989, when Sarah Elgin, professor of biology, brought University City middle and high school teachers together with WU science faculty and staff. This group obtained funding from the National Institutes of Health to develop two curriculum units: one for chemistry (“Ozone: Does it Affect Me?”) and one for biology (“Modern Genetics for All Students”). NIH support provided for materials and technical support in the high school during development of the hands-on units, as well as critical support for curriculum writers. UCHS teachers still use these programs, with support provided by Science Outreach for consumable supplies. The Ozone materials are available on the web at www.nslc.wustl.edu/science_outreach/curriculum/ozone/index.html and some of the Modern Genetics experiments may also be found on the site.

The development of Project SEER (Science Education for Equity Reform), initially headed by Jack Wiegers and John Rigden, also provided opportunities for interaction. WU faculty and staff participated in a number of hands-on workshops with U. City K-5 teachers during the startup years of SEER. This experience led to the development of the Edu 6000 courses at WU, which allow teachers to investigate a subject in greater depth.

University City School District has encouraged all K-8 teachers to participate in the Edu 6000 that has evolved. To date, 30 of U. City K-8 teachers have taken these courses, which provide a springboard to additional special interest science courses, the 15-credit science education certificate and the 30-hour master of arts in education.

In addition, Teaching Teams of undergraduates visit University City classrooms several times each year with hands-on science activities. And starting this year, Teaching Team undergraduates are providing activities and support for after-school science clubs at Barbara Jordan and Delmar-Harvard Elementary schools.

“Because we are next-door neighbors, and share a common interest in hands-on, inquiry-based science education, partnering between WU Science Outreach and U. City schools has often been both convenient and mutually beneficial,” says Elgin. “U. City serves a very diverse student population, and it is important for us to develop materials and programs that work for all students,” she adds.

University City Schools and Washington University Science Outreach: Neighboring institutions team to benefit K-12 students

WU senior Angie Hirbe, left, with students from Hawthorne Elementary School, looking at a human brain. Teaching teams have made more than 50 visits to University City schools since 1995.
Field Science Program Topics for 2000-01 at Tyson Research Center

The Tyson Field Science Program is a self-funded hands-on science education program offering two- to five-hour field trips for St. Louis area school groups. This interactive program for grades K-12 is designed to stimulate interest in the natural environment, as well as to stress observation skills, analytical thought and cooperation. This is where students and nature interact—bringing classroom concepts to life!

The program is located at WU’s Tyson Research Center, a 2000-acre wildlife refuge in western St. Louis County. Tyson is easily accessible from I-44 at exit 269, just 7.5 miles southwest of the I-270 and I-44 interchange.

This list describes the program topics currently available. Please call Susan Flowers, field science program director, (314) 935-8437, or e-mail flowers@biology.wustl.edu for more information or to schedule a visit.

Animals (gr. K-12)

November-February
Explore the classification system of invertebrates and vertebrates. K-8 students focus on the five classes of vertebrates, including life cycles. High school students practice classification and examine both invertebrates and vertebrates.

Aquatic Ecosystems (gr. K-12)

March-June
Visit a pond and creek, and observe the differences between the two. Students collect, identify and compare aquatic organisms, learning the adaptations that enable them to survive in the water. Grades 6 and up measure abiotic factors using water test kits.

Bats (gr. K-12)

September-December
Explore the natural history of bats, including life cycles and adaptations. Visit a quarry cave with hibernating bats. High school students work on classification and research techniques.

Birds and Bird-Banding (gr. 5-12)

December-February
Use “field marks” to identify birds, and work in teams to band captured birds. Visit an outdoor bird observation blind, viewing common winter birds of Tyson. Bird migration patterns, food preferences and winter habits are explored.

Birds and Bird-Watching (gr. K-5)

April-June
Explore the world of birds, including their family life and habitat. Students learn bird-watching techniques, field marks of common birds and the use of binoculars to help them identify birds and observe bird behavior.

Discovering Nature Through the Arts (gr. K-12)

September-October; March-June
Students investigate nature through field observations, drawings, prose and poetry. They will explore how the arts can complement the scientific study of nature.

Flowering Plants (gr. K-12)

April-June
Classify common flowering plants, and use dichotomous and picture keys to identify plants. Students examine flower structures and their functions.

Forest Ecology (gr. K-12)

September-October; March-June
Explore the ecology of an oak-hickory forest. Student investigations will cover tree identification; examination of leaf litter and decomposing logs; and a study of trees, including adaptations, growth and competition.

Geology (gr. K-12)

October; March-June
Explore the karst topography of Tyson by visiting a large quarry cave and the remnants of an old mining town. Learn rock identification techniques and collect specimens. Fossilization and the three major rock classifications are covered.

Insects and Other Arthropods (gr. K-12)

September-October; April-June
Examine and identify the macroscopic fungi, lichens, ferns and mosses of Tyson Research Center.

Non-Flowering Plants and Fungi (gr. 6-12)

September-October; April-June
Examine and identify the macroscopic fungi, lichens, ferns and mosses of Tyson Research Center.

Predator/Prey Relations (gr. K-12)

September-February
Explore the concepts of adaptations, food chains and food webs, trophic levels, population dynamics and symbiosis through activities and outdoor investigations.
Earth Day Water Education Teachers' Guide
The St. Louis Earth Day 2001 Teacher's Guide contains sample educational activities relating to water and aquatic ecology available from local area resources. Contributors to the guide include Washington University Science Outreach, Missouri Botanical Garden, Missouri Department of Conservation, Metropolitan Sewer District, St. Louis Children's Aquarium, the Resource Recovery Project, Missouri Water Information Network, St. Louis Science Center, and others. Available Feb. 1. To receive your free copy contact St. Louis Earth Day, (314) 962-5838.

Earth Day Graduate Credit Teacher's Course
Visit the “Teacher's Tent” at the Earth Day Festival on Sunday, April 22 at the World's Fair Pavilion in Forest Park. Experience hands-on activities from the teachers’ guide that you can use with your students. In addition, attend the symposium, “Our Water, Our Rivers: St. Louis as a 21st Century River City” to be held at the Missouri Botanical Garden on April 27. Receive graduate credit for your participation. For more information about this graduate credit opportunity, contact the St. Louis Children's Aquarium, (314) 647-6011.

Earth Day Boat Regatta
Design boats made of recycled materials and join a contest in Forest Park on Earth Day, April 22, to see how far and fast they will float! Plenty of fun and science learning for all. Contact the UM-St. Louis Educational Materials & Resource Center, (314) 516-6826, or the St. Louis Teacher’s Recycle Center, (636) 227-7095, for Regatta guidelines and free materials.

Earth Day Service Projects
• Stencil storm drain sewers with your club, class, or youth group to help keep our storm water drainage pollution free. Contact Resource Recovery Project, (314) 481-8770 or MSD, (314) 768-6340.
• Adopt a stream in your neighborhood and join 1700 other Stream Teams across Missouri. Contact Missouri Department of Conservation, (573) 751-4115, ext. 3166.
• Assist with wetlands restoration in an urban setting. Contact University City Green Center, (314) 725-8314.
• On Earth Day weekend, participate in the clean-up of the Meramec River Greenway and/or of Post-Dispatch Lake in Forest Park. Contact Open Space Council, (636) 273-6788.

Earth Day All-Species Parade & “Species Speak” Performances
The All-Species Parade returns for its 11th year. Have your students identify with, learn about, and make a costume of, one of the many marvelous species on the planet. Then march in the Parade in Forest Park on Earth Day, April 22. Or, create a piece of performance art representing the point of view of your selected species and perform it at the Saint Louis Zoo. Contact the Saint Louis Zoo, at (314) 768-5466 for a free parade preparation packet and “Species Speak” information. (Includes a coupon for free materials from Leftovers, Etc. to make your costumes with.)

Earth Day Field Trips
Take a spring class field trip to one of two St. Louis County Parks for guided participation in the restoration of a fen, stream, or prairie. Contact St. Louis County Parks, (314) 615-4FUN for reservations.

Earth Day Web Site
Access more water-related educational resources from the St. Louis Earth Day web site, www.stlouisearthday.org. In addition, you can log on as a participant, and receive updates as our Earth Day planning unfolds!

with thanks to our Earth Day Education Outreach Partners:
Americorps-St. Louis Partners • Art from Recycled Materials • Arts in Transit, Bi-State Development Agency • Conservation Federation of Missouri • Gateway Center for Resource Efficiency • The Green Center • International Center for Tropical Ecology • Leftovers, etc. • Metropolitan Sewer District • Missouri Botanical Garden • Missouri Department of Conservation • Missouri Department of Natural Resources • Missouri Stream Teams • The Monsanto Fund • The Nature Institute • Resource Recovery Project • St. Louis Art Museum • St. Louis Children's Aquarium • St. Louis Community College at Meramec • St. Louis County Parks • St. Louis Science Center • St. Louis Teachers’ Recycle Center, Inc. • Saint Louis Zoo • University of Missouri Outreach and Extension, Water Quality Program • UM St. Louis Educational Materials and Resource Center • Washington University Science Outreach
Awards... nominate your colleagues
• The ChemEcology Education Center is again sponsoring the American Chemistry Council Responsible Care Catalyst Awards for outstanding middle and high school teachers of science and chemistry. National winners’ schools receive $5000; regional winners’ schools receive $2500. Winners receive expense-paid trips for two to the awards dinner. For forms and information, visit www.cmahq.com/chemmag.nsf/WebMagazineArticle?ReadForm&mfik-4qhlqx. Application deadline is Jan. 15, 2001.

• The National Association of Biology Teachers awards include: the Outstanding Biology Teacher Award (grades 7-12); the Outstanding New Biology Teacher Achievement Award (grades 7-12); the Biotechnology Teaching Award (grades 9-12); the Middle School Teaching Award (grades 5-8); and the Award for Excellence in Encouraging Equity (grades 7-12). The OBTA deadline is Feb. 1, 2001, all others are March 15, 2001. Call Science Outreach for nomination forms, (314) 935-4229, or e-mail dana@biology2.wustl.edu.

• Honorary membership in NABT: members may nominate outstanding individuals in science education for a year’s honorary membership. Deadline is May 1, 2001. Call Science Outreach for nomination forms and information, (314) 935-4229 or e-mail dana@biology2.wustl.edu.

Awards... empower your students

• Craftsman/NSTA Young Inventors Awards Program recognizes students in two categories, grades 2-5 and grades 6-8, for inventing a functional tool that solves a real problem. Winners receive $5,000 or $10,000 U.S. savings bonds, and teacher-sponsors receive free gifts from Sears. Deadline is March 12, 2001. Forms and information at www.nsta.org/programs/craftsman.html, or call (703) 243-7100.

• The Toshiba/NSTA ExploraVision Awards Program is open to students in grades K-12 who work in teams to envision what a current form of technology will be in 20 years. Each entrant receives a gift; winners receive $10,000 or $5,000 U.S. savings bonds plus expense-paid trips for themselves, parents and teachers to the awards weekend in Washington, D.C. Deadline is Feb. 2, 2001. Visit www.toshiba.com/tai/exploravision/ or call (703) 243-7100.

Grants
• Toyota TAPESTRY Grants are some of NSTA’s largest awards. The program will accept applications until Jan. 18, 2001. Grants of up to $10,000 for projects plus expense-paid trips to the NSTA national convention are awarded to 50 K-12 teachers. Visit www.nsta.org/programs/toyota.htm or call (703) 243-7100 for forms and information.

• Verizon Foundation’s Growth Initiatives for Teachers encourage 7–12 math and science teachers to form partnerships to develop school enrichment projects that use technology creatively. Projects must involve students during 2000-01 and have professional development components. Winning teams share grants of $15,000 and expense-paid trips to the Verizon laboratories in Boston and to Washington, D.C. Application deadline is Jan. 12, 2001. Download forms from foundation.verizon.com/04010_a.html, or e-mail gift@verizon.com or call (800) 315-5010 for information.

Professional development
• The 2002 NSTA national convention is March 27-30, 2002, in San Diego. Proposals for sessions are due April 16, 2001. Visit www.nsta.org/conv/presenters/pjustforms.asp, call (703) 312-9221 or e-mail conventions@nsta.org for forms and information.

• NASA Educational Workshops help K-12 teachers integrate national standards in mathematics, science, geography and technology through activities based on NASA’s state-of-the-art research. Two-week workshops occur June through August at NASA facilities nationwide. Applications are due Feb. 20, 2001. For forms and information, visit www.nsta.org/programs/new.htm or call (703) 243-7100.
Season's Greetings from Science Outreach

Enjoy winter break!

Classroom resources

• The Orbital Laboratory for Space Explorers gives kids a chance to be a part of the first student-designed plant growth experiments on the International Space Station! Teachers receive kits with standards-based curriculum and plant growing stuff worth $50. Students use the materials to compare environmental data with other classes across the country, then determine optimum growing conditions for the space-based experiment. Launch date is the April 19, 2001 Endeavor mission. Call Gary Arndt at Space Explorers, (800) 965-3763 or e-mail gary@space-explorers.com.

• Join Discovery’s latest expedition with the American Museum of Natural History to search for the prehistoric ancestors of today’s sharks. Students can also participate in the “Make Your Own Shark” activity. Visit school.discovery.com/schooladventures/prehistoric-sharks/prehistoricsharks.html.

• Discovery Channel’s Animal Cams let you study feeding sharks, ant colonies, bats, penguins and more up close in their habitats. Visit school.discovery.com/lesson-plans/activities/biomebehavior/cams.html.

Seminars

• The Academy of Science of St. Louis Seminar Series is a wonderful chance to meet colleagues and hear about groundbreaking research free of charge. All seminars are Wednesday evenings from 7:30-9 p.m. in the St. Louis Zoo’s Living World; free parking is available in the Zoo north lot. Call the Zoo at (314) 781-0900, ext. 340, or the Academy at (314) 533-8083 for information. Topics/dates are:
  — Alzheimer’s Disease: Who Will Develop it as We Live Longer?/Feb. 21, 2001
  — Dating Rocks: Modern Techniques for Determining the Age of Dinosaurs, Mountains and the Earth/March 14, 2001
  — Life on Mars: A Minerals Perspective/April 18, 2001
ATTENTION TEACHERS:

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Have you recently completed a degree or received an award? Tell Science Outreach, and we’ll publicize your accomplishments in our newsletter.

Send items to Dana Benedicktus, newsletter editor, Washington University, Campus Box 1137, One Brookings Drive, St. Louis, MO 63130, or e-mail dana@biology2.wustl.edu.

Kristin Brooks, second grade student, left, and Caleb Higginbotham, first grade student, work on a science project in Kathy Reuter’s classroom at Kratz Elementary School in the Ritenour School District. Reuter completed her fourth semester of Edu 6000 in December. She took this photo of her students as they use materials from the Edu 6000 classes.

Congratulations, Kathy!