Introducing … MySci hands on science for elementary students

Take your K-2 students on a walk through the woods, or an expedition to a limestone cave – without leaving school grounds! It’s possible through the newest Washington University Science Outreach program, MySci hands on science for elementary students. Young students can learn science through inquiry, then explore the Investigation Station, a unique roving vehicle containing replicas of natural Missouri environments. They can also view tadpoles on video microscopes and touch mineral specimens from the St. Louis Science Center’s collection.

Elementary schools participating in MySci select from three subject areas: plants, animals, or earth science. All participating K-2 teachers can attend an introductory workshop, and receive inquiry curriculum and loaner materials kits. When the MySci Investigation Station visits the school, program educators will guide students through an experience that complements the classroom curriculum. The Investigation Station will remain at the school for a four-day period, allowing after school and parent programs to host science nights or other special events.

“I was interested in working on this project because as a teacher, I saw how extracurricular resources provide the experiences that children need to become excited about science,” says MySci instructor Skyler Harmann. “MySci brings those experiences right to the schools,” she says.

A collaboration between Washington University, the St. Louis Science Center, the Missouri Botanical Garden, the Saint Louis Zoo, and the University of Missouri-St. Louis, MySci is sponsored by Monsanto, through a generous gift to Washington University Science Outreach. Teams of educators, faculty and students from the School of Art developed curriculum and designed the MySci Investigation Station.

“MySci brings inquiry learning to young children, and then enriches it through the experience on the Investigation Station,” says Ann McMahon, project director. “I’m thrilled to be involved in MySci, because it encourages young children to get excited about science, and that can help them be successful in school and even in a science career.”

Rosalynn LeNoir, former science teacher at McNair Sixth Grade Center in University City, will team with Harmann on the Investigation Station. “The amount of time teachers need to prepare hands-on lessons is enormous,” she says. “The MySci program will allow them to focus on what matters most — teaching science to children.”

Lemasters Elementary School in Riverview Gardens will host the first MySci visit in November. Drummond Elementary School in Pattonville and Delmar-Harvard Elementary School in University City will also pilot the program this fall. Schools interested in participating in MySci beginning in January should contact Diane Pilla at (314) 289-1448, or dpilla@slsc.org.

The MySci program is supported by the Monsanto Fund.
As area teachers prepared to head back to school, more than 100 teachers continued the work they started early this summer with Washington University Science Outreach. Teachers involved in the St. Louis Math and Science Partnership (MSP) attended summer graduate education courses in math and science content and instruction. Then, these teachers extended their learning by attending post-course meetings on their own districts’ curriculum with Science Outreach staff and expert educators. The additional time and resources helped teachers customize their learning for their own classrooms and students.

Customizing means that graduate courses, held in intensive formats in June, were just the beginning of a summer of hard work. Elementary and middle school teachers participated in the two courses, Edu 6019 Researched Practices in Math Education, and Edu 6008/6014 Science Leadership Academy I/II. Then they returned to campus in grade-level groups, to work on a specific unit with their own district’s textbooks.

Elaine Laura, grade 6 math teacher at Hawthorne Elementary in University City, joined meetings at Washington University in July. “I feel as though we have enough time to go over the material,” she says. “The way this is presented, you think, I can do this in my class. You can follow through in a way that kids will take ownership.”

Middle school science teachers from Riverview Gardens and Ferguson-Florissant met in July to develop lessons around science kits provided by the grant. Barb Rain, science teacher at Ferguson Middle School, returned for her third summer working with Washington University, this time on a geology unit. “It keeps getting better and better,” she says. “Finally this year, we realized how helpful the course has been. Teachers never have time to do this. But we know our kids, so we know how to set it up to work.”

In addition to the graduate study, the St. Louis MSP also supported the Connected Math Program Users’ Conference in August. The two-day conference was an opportunity for middle school math teachers who use CMP to share strategies with each other. Teachers and consultants from Michigan, where the curriculum was developed and tested, led sessions, as did experienced local teachers. Sarah Riss, assistant superintendent at Webster Groves, led a session on curriculum adoption and teacher development from the administrative point of view.

“We’re working to build a regional support for teachers who use CMP, so they can turn to someone and say, what worked for you, and get feedback on their own teaching,” says Karen Brannon, math coordinator. Brannon is also planning to continue the sharing started at the conference through a CMP Users Group that will meet during 2005-06.

Support for both teachers and school administrators is part of the overall vision of the St. Louis MSP, says project director Victoria May. “We are working as partners with the districts,” she says. “We say, what is your plan for curriculum, for teacher workshops, and then we fill in the gaps, and provide training and materials that are beyond their budgets.” The St. Louis MSP provides programs designed to improve student achievement in math and science in Maplewood-Richmond Heights, Ferguson-Florissant, Riverview Gardens, University City, and Webster Groves.

In 2005-06, teachers involved in the summer professional development will continue working with St. Louis MSP staff, including Brannon; plus science coordinators Darlene Norfleet, Jack Wiegers, and Mark Kalk. To learn more, visit www.so.wustl.edu and check the St. Louis MSP page. More than 200 teachers and 3,000 students will be involved in the project this school year.

The St. Louis MSP is supported by the National Science Foundation.
St. Louis MSP: Ascend students take their learning to the workforce in summer 2005

As a high school student, it’s not unusual to spend the summer working. But for 40 students involved in the Ascend program, summer work involved caring for endangered beetles at the Saint Louis Zoo, handling client calls in a legal office, participating in a paleontology program at the St. Louis Science Center, doing research in chemistry at St. Louis University, and working in Science Outreach at Washington University. To help these young workers be successful, the program included sessions on career skills development each Friday.

Scaffolded Math and Science Literacy for Youth Who Struggle with Reading and Writing

Presented by Kathleen Hinchman, Syracuse University

Find out how one group of urban middle math teachers combined cognitive and social approaches to develop successful strategies and assessments.

Rethinking Resistance: Literacy Strategies to Support All Learners

Presented by Carolyn Colvin, University of Iowa

Practice literacy strategies that counteract negative experiences some minority students have had, and build on the cultural resources they bring to school.

Date: October 20, 2005, 8 a.m.-4:30 p.m.
Location: Washington University Hilltop Campus, Lucy and Stanley Lopata House, lower level
Cost: $50, includes lunch and parking; free to St. Louis MSP district staff
Information: Peg Finders, (314) 935-8093, mfinders@wustl.edu
Registration: Paula Smith, (314) 935-6846, psmith26@wustl.edu

The Critical Reading and Conversations conference is supported by the National Science Foundation.
Summer 2005 Research Fellows take lab science back to school

What does this have to do with the real world?

Science teachers who do lab internships are better prepared to answer that question than most. The teachers involved in this summer’s internships through Washington University Science Outreach will be able to tell their students what it’s like to do field ecology surveys, study gene sequences of cancer patients, or collaborate with researchers in a lab.

“It’s credibility with kids and the rest of the faculty — simply the fact that we’re doing what we’re teaching,” says Cheri Stephens, chemistry and forensics teacher at Washington High School. Stephens returned for her third summer to develop a curriculum unit for high school biology. Her investigation allows students to test DNA from aquatic microorganisms to determine species diversity. Stephens adds, “Writing curriculum is so much more involved than I gave credit! I have a much greater appreciation for the curriculum I’m provided with.”

Teachers who return to the program for additional lab and curriculum development work say they have learned a great deal about their research topic, lab techniques, and presenting scientific topics to colleagues.

“One of the new teachers had that glazed look in her eyes, you could see her thinking ‘What is this?!’” laughs Stephens. But, she says that experience is normal. “That’s exactly where we were three years ago.” Returning interns also included Anne Deken of St. Genevieve Du Bois School, Mike Grupe of Lutheran North High School, and Elmer Kellmann, former of Parkway Central High School.

Tracy Haynes, biology teacher at Roosevelt High School, said the program helped her get up to date after seven years as a physics teacher. “This is the right thing to get me acclimated to what’s going on in biological sciences,” she says. Haynes worked at the Washington University Genome Sequencing Center with one of her colleagues from St. Louis Public Schools, Peggy Presley, science teacher at Stevens Middle School. Haynes worked on profiling the gene sequences of patients at Barnes Hospital, while Presley worked on a project to help researchers better understand how salmonella leads to severe cases of food poisoning.

“We have separate projects, but we see each other daily, and bounce ideas off each other,” says Presley.

Haynes adds, “Working with people is great because when you’re a teacher, you’re in your class, isolated, and not interacting. It’s nice to be in an environment where people are cooperating and sharing and learning together.”

Teachers built collegial relationships with each other and with Washington University scientists. Stephens credits Karen Preiter, graduate research assistant, for her help with lab techniques and for loaning her classroom materials over the past three years.

One challenge for teachers was adapting to the often slow and painstaking process of scientific research. “I’m so used to my high school schedule, with bells and structure,” said Melissa Pierce, chemistry teacher at McCluer High School in Ferguson-Florissant. “The lab is way more laid back, so it took me a little bit to get used to that.”

Bill Thoele, teacher at Christian Brothers College High School, remembers that during his first summer, he was frustrated by the slow pace as well. “Taking notes is tedious, but in research, you write down everything!” he comments. Thoele developed a curriculum for high school biology using genetically engineered soy beans. Students participating in another Science Outreach program helped him to test the project (see related story, St. Louis MSP Ascend students, p. 3).

Two teacher interns, John McGrath, Vashon High School, St. Louis Public Schools, and Brett Barron, Hazelwood Central High School, worked together on surveying diversity in bird populations across the St. Louis area. Certain types of birds are more likely to act as hosts for mosquito-borne West Nile virus. The study’s findings currently suggest that higher diversity in the bird population correlates with lower incidents of West Nile virus.

“If results are as we expect, we may try to encourage bird diversity, by planting trees, building nest boxes, and getting kids involved in schools and parks,” says Barron. “Anytime you can get kids doing hands-on work, that’s a lot better than sitting in the classroom.”

Teachers in the program are excited about contributing to advances in scientific research. “It’s a fascinating concept, that you can take DNA from one thing and grow in a phage and replicate it, and examine a possible way to a cure,” says Presley. “To research ways to make life continued next page
better, the possibilities – 50 years ago there was no cure for polio or smallpox, and now you don’t have to think about it. So 50 years from now maybe we won’t have to think about cancer, diabetes, or Alzheimer’s.”

So when science teachers hear the question, “What does this have to do with the real world?” they can point to their own work in medicine, public health, and agriculture, and tell their students, “Everything.”

The teacher internship program is supported by the National Institutes of Health, National Human Genome Research Institute; and the Howard Hughes Medical Institute.

Modern Genetics adopts St. Louis Public high schools Beaumont and Vashon

As the basis for new technologies and advances in medicine, the field of genetics is having a profound effect on the workplace and on health care for every citizen. So it’s more important than ever that every high school student graduates with an understanding of how genetics affects their lives. Through the Modern Genetics for All Students program, high school students can learn the basics of genetics and DNA using hands-on labs.

When a high school becomes a program partner, all biology teachers receive a graduate course in genetics, lab equipment, curriculum guides, and free prepared lab supplies for two years. Schools remain partners as long as they wish, paying only for the cost of raw supplies after the second year. In 2005, the program welcomed two St. Louis Public high schools, Beaumont and Vashon.

Biology teachers from new partnership schools took Bio 4732 The Gene Revolution: Modern Genetics for All Students this summer. They included: Derek Carter, Carmela Davis, and Shanae Jenkins from Beaumont; Ray Cummings, Arthur DuPree, John McGrath, and Jeanne Schulte from Vashon. New teachers from other partnership schools who took the course included: Michelle Irving, Affton; Anthony Fernando, East St. Louis; Karen Griffon, Elsberry; Krista Kuchem, Washington; and Joe Boeckman, Webster Groves. Mary Burke, Academy of Science of St. Louis; and Maria McArthur and Latricia Wallace, from the Washington University Genome Sequencing Center, also participated in the course.

Marty Warren, biology teacher at East St. Louis High School, is starting her second year as a Modern Genetics partner. “I also teach an after school program for kids who need to catch up,” she says. “Now these kids are making DNA and cell models, which is a graduation requirement in Illinois.”

Beaumont and Vashon bring the number of fully supported Modern Genetics partners to 21 schools. Last year, nearly 100 teachers and 6,000 students used all or part of the Modern Genetics hands-on lab investigations in area high schools.

Modern Genetics is supported by the Howard Hughes Medical Institute and the Monsanto Fund.
Tyson Field Science Program

Get outdoors with students and family in the fall

The science of ecology comes alive when outdoor explorations help students build their own understanding of Missouri oak-hickory forests, caves, and natural history. Join experienced educators with the Tyson Field Science Program for a variety of experiences geared to your students and curriculum.

All programs are held at Tyson Research Center, Washington University’s biological field station in St. Louis County. Tyson is located at I-44 and Beaumont Antire Road, just 7 miles west of I-270.

For additional information, plus rates for all Tyson programs, contact Marty Galganski, (314) 935-8437, mgalganski@wustl.edu.

To register for a program, contact Joyce Duncan, (314) 935-8430, jduncan@wustl.edu. Visit www.biology.wustl.edu/tyson for more information on Tyson education programs.

Two–for–One Integrated Programs for young elementary students

Choose topics that match your curriculum for a two or four hour field experience.

Animal Characteristics and Interactions: Study organisms in Tyson’s forest, cave, or ponds.

Earth Materials: Collect and identify fossils from an ancient sea.

Language Arts/Fine Arts: Use journaling as the basis for discovery and creative expression.

Native American Lives: Discover ancient ways of life through archaeology.

Early childhood programs

For children ages 3-6, choose one topic for a two-hour experience.

Adopt a Forest

All Abuzz

Batty for Bats

I’m a Rock Hound

In the Hollow

Moves and Clues

On the Trail

Interdisciplinary Programs for middle school students

Interactive programs focus on data collection and observations, and can include ties to Missouri History. Tyson educators can also do follow up activities in the classroom. Design your own program from the following.

Earth Systems and Geology: Use evidence in caves and creek beds to prove the existence of an ancient sea in St. Louis County.

Earth Systems, Geography and Water: Use topographic maps to explore watershed formation, and predict the human impact on the land.

Ecology: Explore adaptations, populations, limiting factors and food webs at Tyson.

Ecology of the Forest: Food webs and interactions can be observed first hand in Tyson’s oak-hickory forests.

Ecology of the Cave: Learn how the wild inhabitants of Tyson’s human-made cave have been affected over time.

Geology and Economics: How did the landscape at Tyson affect a 19th century quarry mine and town?

Interdisciplinary Programs

Experiences and Stories of Missouri: How have Native Americans and European settlers used the land at Tyson over the past 2,000 years?

Family Fun programs for ages 3–12

Enjoy the outdoors and learn about nature with your children. Cost is $5 for one child and one accompanying adult. Additional adults are $5 each.

Preregistration is required: call (314) 935-8430 or jduncan@wustl.edu.

Pioneer Days, Sept. 27, 9:30 a.m.–noon

Batty for Bats, Oct. 3, 12:30–2:30 p.m.; Oct. 24, 12:30–2:30 p.m.

The Legend of Minke Hollow, Oct. 21, 6:30–8:30 p.m.

Turkey Talk, Nov. 15, 12:30–2:30 p.m.

Fossils, Dec. 8, 12:30–2:30 p.m.

Peace Symbols, Jan. 19, 12:30–2:30 p.m.

For the Birds, Jan. 26, 9:30–11:00 a.m.

One Cool Coyote, Feb. 6, 12:30–2:30 p.m.

Making a Map, Feb. 28, 12:30–2:30 p.m.
Spring 2006 Education 6000 Hands-On Science K–8 classes

Teachers of young students know that kids learn science best when they can explore ideas using hands-on investigations. The Education 6000 Hands-On Science K-8 series helps teachers learn the science behind the standards, plus inquiry strategies for teaching them. Washington University faculty instruct each course, and experienced K-8 teachers provide practical classroom approaches. All courses include free books and materials.

“These classes are very helpful,” says Melanie Canaday, science teacher at Berkeley Middle School, who has taken several Education 6000 courses. “They give me the additional information in the sciences that I need.”

Choose from two courses for the spring 2006 semester:

Edu 6002 Heredity and Life Cycles
How do plants and animals pass their traits on to the next generation? Use plants, animals, and imaginary organisms to compare life cycles, explore genetics, discuss different types of reproduction, and analyze mutations. Demonstrate natural selection through simulations, and learn about effective ways to teach evolution. Topics include Mendelian genetics, mutations, DNA, genetically modified foods and other new developments.

Instructors: Jack Diani and Mark Kalk, Washington University; Paul Markovits, Pattonville School District
Dates: Tuesdays, 4:30-7 p.m., Jan. 17-May 9, 2006

Edu 6015 Earth Systems
Help your students meet the Missouri Grade Level Expectations for earth science. Explore water cycle, erosion, the earth’s composition, weather patterns, geology and natural resources. Receive classroom materials including rock and mineral kits, weather instruments, geology tools.

Instructors: Marty Galganski, Tyson Field Science director; Sharon Kassing, Saint Louis Zoo
Dates: Wednesdays, 4:30-7 p.m., Jan. 18-May 10, 2006

Course registration
Credit: Three graduate credits in education provided for each course
Cost: $200 registration fee for each course
Register: Contact Paula Smith, (314) 935-6846, psmith26@wustl.edu
Location: Both courses are held on the Washington University main campus.
The Education 6000 series is supported by the Howard Hughes Medical Institute and the National Science Foundation.

Science Outreach curriculum online
Science Outreach curriculum combines the expertise of K-12 teachers, Washington University faculty, and informal science educators to create inquiry science experiences for students. Visit www.so.wustl.edu for these free downloads:
- Modern Genetics for All Students, for grades 9-12
- Health in Today’s World, for grades 3-5
- The Ethogram and Animal Behavior Research: in your classroom and at the zoo, for grades 5-8
- The Life of a Litterbug: the ecology of populations and communities, for grades 5-8
- The DNA Show, an educational theater skit on genetics, for grades 7-8
- Aquatic Ecology and Human Impact, for grades 8-10

Curriculum development was supported by the National Institutes of Health, National Center for Research Resources; and the Howard Hughes Medical Institute.

Keeping busy
Maura Brueggeman, eighth grade science teacher at Whiteside Middle School in Belleville, Ill., was selected by Boeing to attend the Teachers at Space Camp program at the U.S. Space and Rocket Center in Huntsville, Ala. “It was truly the adventure of a lifetime,” says Brueggeman. “And my students are definitely benefiting from my increased knowledge and hands-on experience.” For photos, visit Brueggeman’s website, http://webpages.charter.net/mbrueggeman.

Elaine Alexander, volunteer coordinator at University City High School, received the district’s PACE award for service above and beyond the call of duty. She received the award at the district recognition dinner in May.
Science Outreach thanks partners

Science Outreach programs depend on faculty and staff who mentor lab fellows, provide materials, instruct courses, and much more. We greatly appreciate all you do for K-12 teachers and students!

Edu 6000 Hands-On Science K–8
Sharon Kassing, Saint Louis Zoo
Jim Jordan, Saint Louis Zoo
Diane Key-Biggs, Saint Louis Zoo
Pat Gibbons, physics
Garland Allen, biology
Erik Herzog, biology
Marty Galganski, Tyson
Jane Walker, Tyson

Summer Research Fellows
Sarah C.R. Elgin, biology
Jen Godfrey, genetics
Henry Bauer, genetics
Mike McClelland, genetics
Tracie Minor, genetics
Madeline Wiechert, genetics
Brian Allen, biology
Eric Richards, biology
Hui-fen Kuo, biology
Mike Dyer, biology
Mike Veith, genetics
George McMurray, biology
Jon Chase, biology
Karen Preiter, biology
Barbara Kunkel, biology
Eric Richards, biology
Carla Easter, genetics
Andrea Holmes-Bowens, genetics

Equipment donations
Danny Kohl, biology
Philip Harries, biology

Modern Genetics for All Students
Sandra Clifton, genetics
Mark Johnston, genetics
David Wilson, pediatrics
Martin Israel, physics

St. Louis MSP
Diane Grubbs, Ferguson-Florissant School District
Mike Morales, Emporia State University

Summer Scholars in Biology and Biomedical Research
Igor Efimov, biomedical engineering
Victor Guallar, computational biology
Perry Bickel, cell biology and physiology
Tim Schedl, genetics
Stephen Johnson, genetics
Jim Cheverud, anatomy and neurobiology
Patrick Stuart, ophthalmology
Maurine Linder, cell biology and physiology
Justin Fay, genetics
T. Joseph Kappock, chemistry
Susan Dutcher, genetics
Daniel Link, pathology and immunology
Stephen Beverley, molecular microbiology
Joshua Maurer, chemistry
Usha Andley, ophthalmology
David Beebe, ophthalmology
Joel Price, anatomy and neurobiology
Nathan Baker, computational biology

Fall 2005

New Monsanto MySci program
St. Louis MSP
Middle School Math and Science Conference
Ascend program
Summer Research Fellows
Modern Genetics for All Students
Tyson Field Science Program
Education 6000 spring 2006

Dwayne Simmons, otolaryngology
Jianxin Bao, otolaryngology
Paul Stein, biology
Mark Johnston, genetics
Petra Levin, biology
Mike Neff, biology
Erik Herzog, biology
Ralph Quatranro, biology
Barbara Schaal, biology
Sarah Elgin, biology
Eric Richards, biology
David Heyse, biology
Sharon Stahl, Arts & Sciences

Washington University in St. Louis
Department of Biology
Science Outreach
Campus Box 1137, One Brookings Drive
St. Louis, MO 63130-4899

Address Service Requested