Elaine Alexander doesn’t mince words when describing how a group of Arts and Sciences student volunteers, called Teaching Teams, feel about teaching hands-on science to area youngsters: “It’s spontaneous combustion.”

Fueled by their passion for science, undergraduate and graduate students venture into K-12 grade classrooms to ignite youngsters’ enthusiasm with hands-on science lessons on subjects ranging from geology to genetics. For their efforts, Washington University students receive letters highlighting their work, along with volunteer hours that many of the undergraduates list on medical or graduate school applications.

“I hope to show that science is not exclusive,” said senior Doug Ramsey. “I think kids should understand that science is something that they can grasp, and I hope to spark their interest.”

Funded by the Howard Hughes Medical Institute for the past five years, the Teaching Teams have made approximately 700 visits to schools and have presented to over 15,000 students. “It’s so fun to see students who expect dissection to be “gross” or “boring” begin to ask questions and want to participate,” junior Heather Knowles said.

This fall, the undergraduate teaching teams have already made 40 school visits. To learn more about the teams and to schedule a visit to your school for the Spring semester, contact the project coordinator, Elaine Alexander at 935-7170, elaine@biology.wustl.edu.

Adapted from Washington University Arts and Sciences.

Teaching Team Topics
Grades 3-6 Geology, Rocks and Minerals
Matter - Physical and Chemical Changes
Grades 3-7 Heart Smart
Plant Propagation
Simple Genetics
This in Your Brain
Water Cycle
Grades 3-8 Chemistry
Dissection
Doing a Good Science Fair Project
Physics
Grades 5-8 Biomedical Ethics
Grades 9-12 Molecular Biology
Biomedical Ethics

We would like to welcome the newest member of Science Outreach at Washington University - Gary Corbin. Gary was a high school biology teacher at Vianney High School in St. Louis for the past 30 years and therefore, brings a wealth of knowledge and practical lessons to our outreach efforts. Gary will be working with the high school program, "Modern Genetics for all Students" as the program coordinator. His responsibilities include teacher professional development, curriculum editing, materials management, and curriculum implementation. A big "Welcome" to Gary!!
Teaching the Science of Nature II

Another Great Professional Development Opportunity

Need two graduate science or education credits? Interested in updating your science background and learning more about Missouri’s ecological habitats? Then, ”Teaching The Science of Nature II” is an excellent course for you!

This spring semester, Science Outreach offers an ecology course for K-8 teachers that focuses on “Ecology: Interactions and Changes” as outlined in the Science Education Standards.

Credit

Two hours of WU credit, either in Biology or Education, are awarded to participants in the course. (Bio 4002 or Educ 4002)

Fees

Course fees are waived due to funding from the Missouri Coordinating Board for Higher Education. Participants pay only the $50 registration fee.

Instructor

Dr. Richard Coles, ecotour leader and former director of Tyson Research Center.

Math Course for Elementary Teachers

Looking for a math course to update your mathematics background? Math 266 is the answer. This course meets 4:00-5:30 Mondays and Wednesdays this spring semester. Enroll through University College located in January Hall. For more information call University College at 935-6700.

Math U20 266
Prerequisite: Two years of high school mathematics
Instructor: Dr. Gary Jensen
Credit: 3 units
Cost: $750
(Math and Science Institute Fellows receive tuition support for this class. Call Vicki May about the Fellows Program)

The class meets half or whole days for 12 Saturdays, beginning January 22.
The course schedule is outlined below:

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>January 22</td>
<td>Missouri Mammals</td>
</tr>
<tr>
<td>March 11</td>
<td>Amphibians and Reptiles: Amphibians as an Environmental Indicator</td>
</tr>
<tr>
<td>March 18</td>
<td>Animal Camouflage and Advertisement</td>
</tr>
<tr>
<td>April 1</td>
<td>Bird Navigation and Migration</td>
</tr>
<tr>
<td>April 8</td>
<td>Insects and Man</td>
</tr>
<tr>
<td>April 15</td>
<td>Pond Life</td>
</tr>
<tr>
<td>April 29</td>
<td>Arrival of Spring Bird Migrants</td>
</tr>
</tbody>
</table>

Enrollment and Registration

Enrollment for the course is limited to 20 teachers; applications are evaluated as received. Teachers who participated in “Teaching the Science of Nature I” taught this past summer by Ms. Judy Tisdale, are still eligible to receive credit for this course.

To apply, complete the registration form on page 7. The $50 registration fee will be collected at the first class, January 22. For more information call Vicki May, Science Outreach Director, (314) 935-6846 or e-mail may@biology.wustl.edu.

Washington University’s Science Outreach is interested in communicating to K-12 science teachers all the wonderful opportunities that are available on campus and in the St. Louis area. As always, questions, comments, ideas and contributions are welcome!

Science Outreach Director
Victoria L. May
may@biology.wustl.edu
935-6846

Chairman of WU Biology Outreach Committee
Sarah Elgin
selgin@biology.wustl.edu

Science Outreach Program Coordinator
Elaine Alexander
elaine@biology.wustl.edu

Modern Genetics Program Coordinator
Gary Corbin
corbin@biology.wustl.edu

Communications and Graphics
Mike Wirtz
wirtz@biology.wustl.edu
by TONY FITZPATRICK

Twenty one St. Louis City and County science teachers participated in a two week genetics course to familiarize themselves with molecular biology and a curriculum unit that engages high school students in learning about DNA and biotechnology in a hands-on way. "Genetics used to be boring, but now it's exciting with a curriculum like this," said Loretha Allen, science department chair at Beaumont High School and a 32-year teaching veteran. "None of the biology we learned here was in textbooks when I was an undergraduate. This is a lifesaver for teachers of biology." The genetics project, which provides hands-on activities, materials to do laboratory-based lessons, and strong implementation support is now a part of the science programs in Jennings, Parkway, Pacific, Riverview Gardens, St. Louis Public, University City, Washington, and Webster Groves school districts. For more information about this program, contact the program coordinator, Gary Corbin at (314) 935-8138, or e-mail corbin@biology.wustl.edu.

Adapted from Washington University Record.

Science Education Certificate Program
Catherine Bauer and Gloria Reilly have completed all the course requirements for the certificate program. Congratulations!

Catherine Bauer
St. Louis Public Gateway Elementary

Gloria Reilly
St. Louis Public Gateway Elementary

Jacqueline Frieda
We are delighted that Jacqueline has been chosen as a Fellow in the Institute for Science and Math Education at Washington University. As a Fellow, Jackie will receive full tuition support for approved coursework to apply toward her goal of a Science Education Certificate! Great going Jackie!

Summer Research
Congratulations to the following teachers who participated in the Washington University Medical School’s Summer Research Fellowship Program for Science Teachers:

Loretha Allen
Beaumont High School

Angela Lane
International Studies at Soldan

Tammy Hall
Riverview Gardens High School

Karen Swain
Jennings High School.

Elaine Kilmer
Congratulations to Elaine Kilmer of John Burrough’s School for receiving the Outstanding Biology Teacher of Missouri Award. Elaine received her award at the National Association of Biology Teachers Convention in Fort Worth, Texas in October.
High school teachers from seven different districts (Belleville, Fort Zumwalt, Francis Howell, Parkway, Rockwood, St. Louis Public, and University City) met for 5 Saturdays this summer from mid-July to mid-August. The course was designed to expand the research methods available to high school teachers for use in teaching about ecosystems. This was accomplished through a series of lab and field experiences:

• Plankton nets were used to sample protists and algae in Forest Park and Tyson Research Center ponds; Diversity indices were used to compare the plankton diversity of the two pond ecosystems.
• Pure cultures of algae were grown in lab with varying amounts of fertilizer (nitrates/phosphates) to measure the effect of farm field runoff on algal populations in surface water.
• A water quality assessment of a stream was performed using both chemical testing techniques and macroinvertebrate sampling.
• A trip to the local water treatment plant offered a comparison of drinking water quality techniques with surface water quality techniques.
• These aquatic experiences were balanced with field trips to Washington State Park where collard lizards were captured, studied, and released.
• The course culminated with a trip to Shaw’s Arboretum to study flowering plants and insect pollinators.

As a follow up to this course, participants are eligible to check out the following kits by contacting Gary Corbin at (314) 935-8138, or email corbin@biology.wustl.edu.

1. Water Quality Testing:
   Nitrate Test Kit
   Oxygen Test Kit
   Thermometers (3)
   Chlorine Test Kit
   Meters: pH, Total Dissolved Solids
   Macroinvertebrate Aquatic Net
   Macroinvertebrate Identification Keys

2. Pollination Ecology Kits
   Insect nets
   Insect identification keys
   Flowering plant identification keys

3. Start your own culture kits:
   Plankton net
   Flour beetles (Tribolium castaneum, Tribolium confusum)
   Cyanobacteria, selected species
   Spirogyra
   Chlorella
   Mixed algae & protists, together creating a pond culture

Receive your Master of Arts in Biology

Washington University’s Master of Arts in Biology program provides opportunities for advanced study that can be applied to a variety of fields.

This degree is for:
• individuals who need graduate course work to prepare themselves for career advancements or changes,
• individuals who would like academic training in emerging biological fields such as recombinant DNA science,
• secondary school teachers who need more advanced knowledge in biological disciplines to enhance their teaching and improve professional standing.

For more information, contact Dean Jane Smith at University College at 935-6727.
Teacher Grant Opportunity: GTE GIFT Grant

GIFT is a grant program for public and private school math and science teachers, grades 7-12. The GIFT grant program was established by the GTE Foundation to promote the integration of math and science in the classroom, to encourage the innovative use of technology in education, and to provide recognition and new opportunities for outstanding teachers.

Each year, GTE awards GIFT grants to 60 teams of one math and one science teacher from the same secondary school who have developed school enrichment projects that integrate math and science and use technology in a creative way. Each winning team shares a $12,000 GIFT grant - $7,000 to implement the school enrichment project and $5,000 ($2,500 each) for the participating teachers to pursue professional development activities. Deadline: January 14, 2000. For more information, visit the GTE website at www.gte.com/AboutGTE/community/gte-foundation/opportunities/gift.html or call Mark Kaufman at (617) 873-9649, or use email, Mark-Kaufman@terc.edu.

Toyota Tapestry Grant

The Toyota Tapestry Program offers grants to K-12 science teachers for innovative projects that enhance science education in the schools. Fifty one-year grants, totaling up to $500,000 will be awarded this year. The deadline for proposals is January 20, 2000. Proposals must describe a project, including its impact on students. The two categories this year are Environmental Education and Physical Science Applications. The individual awards are up to $10,000. To receive a Tapestry Proposal Form and more information about this program, call 1-800-807-9852 or visit the home page: http://www.nsta.org/programs/toyota.htm

Summer Research Opportunity for Teachers of Grades 6-12

Interested in spending 7-9 weeks working full-time on a research project in a physiology research laboratory? If so, you may want to consider the American Physiological Society’s Frontiers Program. Application deadline is the first week in January.

Who should apply? Teachers of grades 6-12 with little or no research experience in the life sciences.

What is the stipend? $500 per week; $250 to attend a Summer Retreat; $300 mini-grant for materials and supplies to use in your classroom.

How do you apply? You must contact an APS research scientist and submit an application together. To locate an APS member in St. Louis and receive an application form, visit the APS web site at http://www.faseb.org/aps/educatn/contact.htm. If you would like help contacting an APS member, we can help you. Contact Vicki May in the WU Science Outreach Office for more information.

ZOO Workshop Opportunities

• Diggin’ into Dinosaurs and Dragons
  Teachers of Grades 1-3
  Saturday, February 5; 8:30-Noon
  Fee: $15.

• Lions & Tigers & Bears, OH MY!
  Teachers of grades PreKg-Kg
  Saturday, March 11; 9-11:30 am
  Fee: $7.

• Zoology for Younger Students: Parts I & II

Some of the seminars in the 1999-2000 Science Seminar Series are:

• January 19:
  Effects of Deforestation on Bird Distribution in Brazil
  by Dr. Betty Loiselle, International Center for Tropical Ecology, UM-St. Louis.

• February 16:
  Evolution/Creation and Science Education
  by Dr. Brian Alters, Department of Education, McGill University, Canada.

• March 15:
  Back to the Future: Archaeology in St. Louis
  by Dr. Joe Harl, Archaeological Research Center.

For further information, call (314) 768-5466 or (314) 533-8083.
TEACHER RESOURCES

Challenger Center Programs
Touching The Future: Linking the Classroom with Space
This one-day teacher training workshop actively engages teachers in hands-on activities that enable them to involve their students in a classroom based simulation of a space shuttle mission. Includes a 140 page teacher’s guide and NASA slides.
February 17, 2000; 9 am - 4 pm.
Fee: $175
Locations: Cooperating School Districts
Register by February 3, 2000
For more information and to learn more about the Challenger Center and NASA programs available for your students, contact Jean Settle at 636-458-5911.

St. Louis Science Center
To receive a Program Guide for the St. Louis Science Center call 314-289-4400.

Learning Resources
Looking for educational resources to enhance your classroom? Check out materials on earth sciences, humanities, space and more. Borrow material for up to two weeks. Simply call Collections at the St. Louis Science Center at 314-533-8282 to arrange a loan. It's FREE to educators!

Public Telescope Viewing
Join the St. Louis Astronomical Society and the Science Center for free Public Telescope Viewings on the Archery Field west of the Forest Park Building on the fourth Friday of the month, weather permitting.
Sessions start at dusk.
These events feature a free star presentation at 8:30 pm in the McDonnell Planetarium Theater.

Howard Hughes Holiday Lectures
Howard Hughes Medical Institute presents their Holiday Lecture on Science:
Live Satellite Broadcast
Monday December 6 and Tuesday December 7, 1999
Each program consists of a one-hour lecture, followed by a live Q & A Session. For more information on the series, visit the website at www.holidaylectures.org or call 703-759-5432. If you are unable to view these programs live, we keep a loaner set of each of the HHMI Holiday Lecture Series in the Washington University Science Outreach Office. Contact Vicki May or Mike Wirtz to borrow the videos.
This Years Holiday Lecture is:
2000 and beyond: Confronting the Microbe Menace
Titles of the Broadcast are:

Monday
• Microbe Hunters: Tracking Infectious Agents
• The Microbes Strike Back
Tuesday
• Outwitting Bacteria’s Wily Ways
• Emerging Infections: How Epidemics Arise

PBS Series
Intimate Strangers: Unseen Life on Earth can be seen on Tuesdays in November, 8 P.M. EST. This four-part series will focus exclusively on the microbial world. Additional resources for teachers, including a Microbe World Exploration kit are available by contacting the National Association of Biology Teachers toll free at 800-406-0775 or visiting the website at www.microbeworld.org

Microbes Website
The NSF-funded curriculum project Science In The Real World: Microbes in Action, has an excellent web page that provides scientific information and hands-on activities in microbiology for K-12 teachers. Visit the site at http://www.umsl.edu/~microbes.

Field trip!
Experience nature’s classroom
The Field Science Program at Washington University’s Tyson Research Center offers field trips for pre-school through grade 12. Preschool programs provide opportunities for young children to develop intellect, language, and social skills. Topics offered are: Bird Songs, Paleontology for Preschoolers, Pond Animals, and Tracks and Traces. K-12 programs are designed to stimulate student interest in the natural environment, as well as to stress observation, analytical thought, and cooperation. All of the topics offered have connections to national, state, and local science standards. Authentic assessments to do with your students are suggested.
The Field Science Program is self-funded, so there is a fee for the field trips. Please call Janice Starke at 935-8437 for more information.
Creative Dough Ideas
From making Indian fry bread to conducting experiments with yeast and sugar to sculpting dinosaurs and other creatures, you can perform a variety of hands-on classroom activities using simple frozen dough. “Classroom Ideas from Rhodes Bake-N-Serv” is a free illustrated booklet for use in grades K through 12.

Send: Your name and address
Ask For: “Classroom Ideas from Rhodes Bake-N-Serv”
Mail to: Rhodes Bake-N-Serv
Classroom Ideas
P.O. Box 25487
Salt Lake City, UT
84125
Limit: One per teacher
Web Site: www.rhodesbread.com

Recycling Activity Sheets
With our increasing population and dwindling resources, recycling is a hotter topic than ever. A set of eight free recycling activity sheets from the Steel Recycling Institute teaches the importance of recycling steel and steel cans through fun word searches and a math activity. Students learn how to collect and recycle steel cans and how old cans are processed into new steel for use in cars, refrigerators, construction beams and other products. The two-sided, 8 1/2” x 11” sheets are reproducible.

Send: LSASE
Ask For: Recycling Activity Sheets
Mail to: Steel Recycling Sheets
680 Anderson Drive
Pittsburgh, PA 15220
Limit: One set per request

Science Magazine
Science doesn’t have to be intimidating for students. In fact, it’s one of the most fascinating and interesting school topics. TOPS Ideas science magazine want to turn students on to this intriguing field by teaching them about oxidation, magnetism, electricity, probability and more. Simple, step-by-step experiments and helpful illustrations fill each 16-page publication aimed at promoting hands-on learning in the classroom. Also included are a variety of lesson plans teachers can order.

Send: LSASE
Ask For: Free issue of TOPS Ideas teacher offer
Mail to: TOPS Learning Systems
10970 S. Mulino Rd.
Dept. FBT
Canby, OR 97013-9747

REGISTRATION FORM FOR SPRING ’00 ECOLOGY COURSE
“TEACHING THE SCIENCE OF NATURE II”
The registration fee of $50 will be collected the first day of class.

Name ________________________________________ Address ______________________________________________
City _______________________ State ________________ Zip ______________________________________________
Home Phone ______________________________ Work Phone ______________________________________________
School ________________________ District ________________________________ Grade ____________________

SEND TO: Vicki May, Washington University, Campus Box 1137, St. Louis, MO 63130
We would like to thank the following people who donated their time and expertise to our Washington University Science Outreach efforts this past summer. The following faculty and staff members have either served as: mentors or seminar speakers for the Prefreshman Summer Scholars Program, mentors for the Science Teachers as Researchers or Science Teacher Fellowship Program, or guest lecturers for the summer courses for teachers: Teaching the Science of Nature, Ecology Laboratory for High School Teachers, and The Gene Revolution—Modern Genetics for All Students.

It is the involvement of exemplary scientists that make our programs unique and valued by the teachers in the St. Louis metropolitan area. Thank you!!

Muthanna Al-Dahhan
Raymond Arvidson
Phyllis Balcerzak
Wayne Barnes
Kevin Black
James Cheverud
Dick Coles
Thomas Croat
Cynthia Csernansky
Jack Diani
Shirley Dyke
Sarah Elgin
Patrick Gibbons
Ursula Goodenough
Paul Stein

Frank Yin
Steven Zheng
Jonathan Green
David Heyse
David Ho
Stacey Huppert
Delbert Hutchison
Doug Johnson
Mark Johnston
David Kirk
Dan Kohl
Barbara Kunkel
Stan Kwasny
Pui-Yan Kwok
Angel Lee

Ruth Lewis
Daniel Link
Ron Loui
John McDonald
Julie Morris
Mike Mueckler
J, Gail Neely
Craig Pikaard
Joseph Price
Ralph Quatrano
Lee Ratner
Eric Richards
Barbara Schaal
Paul Schlesinger