

SEP Newsletter

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SCIENTIST VOLUNTEER ORIENTATION: LECTURE, SCHMECTURE!

by Ellen Kuwana and Erin Peckol

The design of a curriculum matrix in any effective local systemic should include inquiry-based, hands-on exploration in heterogenous cooperative learning groups, with equivalent roles including facilitation and appropriate materials management. Now, what does that look like?

If this doesn't mean anything to you, then you would fit in well with the group of 30 scientists, including students, post-doctoral fellows, and research associates, attending the SEP Volunteer Orientation. The series of three 2-hour workshops served as an initial pilot introducing volunteers to teaching and learning in the context of science education reform. The scientist participants volunteer for a variety of SEP and District programs, including City Science, SF Base, and the Women's Triad Project. The three sessions, designed and presented by SEP staff members, focused on demonstrating—or, in teacher-speak, "modeling"—effective science teaching. While most scientists have prospered in an educational system that embraces the lecture format, that approach is not consistent with the ways young people learn and retain knowledge.

The first workshop eased the scientists into the world of education by placing them in the role of student. The step back into the classroom reminded scientists that it is easier to engage and teach students with a concrete object than a representation of it. This idea was reinforced during the second workshop: "identify the mystery powder." The activity involved three

Happy teachers coming away from the 10th Annual SEP Fall Kick-Off Conference with armloads of computers through the surplus equipment give-away. See story, page 2. Photo by Robert Foothorap.

different teaching methods: open-ended, inquiry-based learning (there is no one correct method or answer, and the process of problem-solving during the activity is emphasized), guided discovery (an activity involving a set procedure with a desired outcome), and didactic learning (limited to lecture and demonstration, i.e. teacher is active and students are passive).

Scientists were further deluged with the educational lingo of cooperative learning. Four pithy maxims were branded in the scientists' minds: no one is good at everything, everyone is good at something, each person has the right to ask for help, and each person has a duty to assist others. We were baptized into the sacred waters of cooperative

learning, a method of small-group instruction. This consists of learning in groups of three or four students, each with a specific procedural role:

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The Science & Health Education Partnership (SEP) is a collaboration between the University of California, San Francisco (UCSF) and the San Francisco Unified School District (SFUSD). Its mission is to support high quality science and health education. SEP is the organizational umbrella for the UCSF-end of the partnership and is made up of both core programs and specially funded projects. Core programs include equipment and supply donations to schools, partnerships between UCSF volunteers and SFUSD teachers, the operation of a resource center, and the SEP Student Lesson Plan Contest. Specially funded projects include *City Science*, *The Women's Triad Project in Science Education* and summer research internships for teachers and high school students. SEP also supports SFUSD projects including *SF Base* and the newly adopted K-8 science and health curricula. SEP is made possible through funds from NSF, NIH, Howard Hughes Medical Institute, Genentech, Herbert W. Boyer, the UC Office of the President, the UCSF Chancellor, and private and corporate donations.

Alberts & Rojas Help SEP Launch 10th Year

The tenth annual SEP Fall Kick-Off Conference celebrated SEP's past and looked to its future with talks and workshops at UCSF on October 2nd. Liesl Chatman, SEP's Executive Director, started things off with a retrospective slide show and anecdotes honoring partnerships between teachers and volunteers. She was followed by Dr. Bruce Alberts, President of the National Academy of

"Another SEP Kick-Off, another jeep-ful of stuff, and another full belly. Must be another year gone by!"

Sciences and SEP's founding father, who told the oft-repeated story of SEP's beginnings. Superintendent Rojas rounded out the triad of speakers by thanking Dr. Alberts for his vision and reiterating the need for programs like SEP.

After the talks, the approximately 150 teachers and volunteers in

attendance took part in workshops on SEP's programs. An overview of SEP's programs helped newcomers find out what is available for their participation, while sessions on old favorites such as the Lesson Plan Contest, SF Base, MedTeach, the Resource Center and City Science, and newer projects such as Bone Science and BrainLink offered a closer look for anyone who was curious. Posters on the Summer Intern Program, Triad Project and Partnerships were also displayed.

Saving the best for last, good food, lots of convivial conversation and the equipment and supply giveaways were as popular as ever. This year, in addition to the traditional plastic ware, heating plates and test tube racks, SEP also donated several computers, Nikon microscopes, and printers. In the words of Lincoln High School science teacher George Cachianes: "Another SEP kickoff, another jeep-full of stuff, and another full belly. Must be another year gone by!"

Bill Rojas, Liesl Chatman, Bruce Alberts, and David Sanchez at the 1996 Kick-Off. Photo by Robert Foothorap.

CITY SCIENCE: A Systemic Plan for Elementary Science in SF

Science Focus Schools

Last spring, three schools, Garfield, Monroe and Spring Valley, applied and were accepted to serve as “Science Focus Schools.” These schools will become laboratories from which to learn how science education reform can be fostered within a whole school. A curriculum team consisting of the principal and three teachers (specialists in science, math and literacy) was designated at each site to develop a plan for implementation of reform in science instruction.

As part of the support structure for Focus Schools, the teams will be joined by partners from UCSF and the Exploratorium. Each school will have a Scientist-in-Residence who will work with the school and its implementation team. After a competitive application process, Sue Parmalee, Reuben Peters, Linda Yuschenkoff, and Karen Zachow were named for these positions. The Exploratorium is also providing support for the Focus Schools through their Teachers-in-Residence, Nancy Schlenke and Steven Green. All will also work closely with Focus School program coordinator Andrew Estrin.

On-Going Professional Development

Last year’s Kit Club program is being revised to look more broadly at professional development in science for SFUSD elementary teachers. With support from District staff members Bonnie Coffey-Smith and Caroline Satoda, an SSL team is designing a program that will provide a professional development offerings to meet a variety of teacher needs. UCSF scientists will continue to be closely involved with this expanded professional development program. With the large number of new teachers in the District, Margo Fontes and Nancy Schlenke are expanding the Beginning Teacher component to provide more support around science teaching. A variety of mechanisms, from mentoring to professional development offerings, are being planned.

Participants in the Beginning Teachers' Institute work with bean plants for the "Structures of Life" curriculum kit.

Institutes & Summertime Learning

City Science participants had plenty of opportunity for learning about inquiry, science, and teaching this past summer through two programs, the Beginning Teacher Summer Institute, which focused on implementing science curriculum units, and an Inquiry Institute for Science Systemic Leaders.

During the Beginning Teacher Institute, 80 teachers participated in two week-long workshops, exploring topics ranging from “The Senses” from a kindergarten perspective to “The Human Body” at the fourth grade level. In so doing, the Institute helped familiarize beginning teachers with Life and Earth/Environmental Science units used in the elementary science curriculum. Experienced SFUSD teachers and UCSF scientists led the workshops, with Andrew Estrin and Margo Fontes providing overall coordination.

Later in the summer, leadership teachers delved into the art of scientific investigation during the Inquiry Institute. The Inquiry Institute provided a deeper level of professional development for the District’s team of 50 Science Systemic Leaders (SSL’s) who, in turn, provide teacher leader-

ship for science education reform in the District. The participants, including two UCSF scientists, focused on developing a deep understanding of what goes into an investigation — how does close observation lead to questions, and how can these questions be formulated so that experiments can be designed to find answers? The Institute was facilitated by SSL committee members Leah Brown, Ellen Champlin, Steven Green, Patty Harmon, Paulette Norberg, and Nancy Sarraga working with Margaret Clark, Bonnie Coffey-Smith, Molly O'Malley, and Barry Kluger-Bell of the Bay Area Science Project.

NSF Funding Transfers to SFUSD

In an unprecedented decision, the City Science Executive Committee elected to change the fiduciary agent of the City Science NSF grant from UCSF to SFUSD. The change addresses organizational needs in moving from a teacher enhancement project to a local systemic change initiative. NSF program officer Susan Snyder applauded the move while on campus last spring; NSF granted final approval for the transfer this past September.

SEP Out and About

CSTA

SEP presented two of its programs at the recent California Science Teachers Association (CSTA) conference in Sacramento. Helen Doyle was joined by Kimberly Tanner and Erin Peckol, UCSF neuroscience graduate students, in two hands-on workshops promoting the BrainLink® project. Workshop attendees discussed the properties of the brain using a variety of unusual models, challenged their memory using tactile mazes, and received information about the Brain-Link® curriculum and upcoming workshops (see calendar on page 6). Erin was a part of another SEP presentation; she along with Erla Hackett, A.P. Giannini Middle School teacher, and Coordinator Katherine Nielsen gave an overview of the Women's Triad Project. Katherine presented research findings on gender equity and the project design; Erla and Erin gave their perspectives as Triad participants.

On the Horizon: NSTA & ASCB

The BrainLink® Project will also be presented at the National Science Teachers Association (NSTA) Global Summit in San Francisco in late December. For this presentation, Helen Doyle will be joined by Judy Dresden and Barbara Tharp from BrainLink® headquarters at Baylor College of Medicine in Houston. The NSTA meeting will be attended by teachers from all over the world, providing a great opportunity to promote the project.

In order to disseminate information about science education reform to the scientific community as well as to the education community, Helen will present a brief overview of SEP's programs at the American Society of Cell Biology (ASCB) meeting on December 10 in San Francisco. She will encourage the cell biologists to share their time, energy, and knowledge with K-12 students and teachers.

UC Urban-Community School Collaborative

SEP was also invited to present two of its programs, the Triad Project and the Summer Intern Program, at a statewide conference sponsored by the UC Office of the President's Urban Community-School Collaborative, held in Berkeley on October 10 and 11. The Triad Project was represented by Liesl Chatman, Executive Director; Katherine Nielsen, Coordinator; Patricia Kudritzki, Aptos Middle School teacher; and Patricia Caldera, UCSF scientist. Liesl set the stage with an overview of SEP, Katherine discussed Triad, and Kudritzki and Caldera, both in their second year with Triad, shared their stories and insights. To present the different components of the Summer Intern Program, SEP organized a panel consisting of: Liesl Chatman, Executive Director; Helen Doyle, Program Coordinator; Len Poli, SF Base Director; Charity Ancheta, Mission High School student and 1996 intern; and Patricia Kudritzki, Aptos Middle School teacher and 1996 intern. The discussion generated much excitement and enthusiasm among the representatives from other UC campuses and school districts.

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materials manager (obtains and returns classroom materials and sees that they are handled responsibly), recorder/reporter (takes notes on the group's activity and presents the group's work to the class), timekeeper (keeps group on track), and facilitator (ensures each role is performed and that the given task is completed). Therefore, each student is equally responsible for the performance of the group, yet performs a unique role within the group.

In the final workshop, the SEP staff questioned the participants to determine how well we understood the teaching methods modeled in the second workshop; in education lingo this is termed reflection and assessment. The remainder of the workshop was devoted to the logistics of teaching; for example, how to prepare and execute an effective lesson plan.

These workshops gave the scientists insights into the concepts, challenges, and vocabulary of teaching and reinforced the link between scientific research and science education. They were made possible through an award from UC Office of the President Regents' Diversity Initiative. Readers from other programs who would like more information about the workshop series should contact Liesl at 476-0337.

Erin Peckol and Ellen Kuwana are UCSF Graduate Students and Triad Scientists.

Preparing for the Scientist Volunteer Orientation, SEP Director Margaret Clark does her own investigation into "mystery white powders" by conducting the Squeak Test.

Mentor Seema Bhahtnagar with intern Wendy Wandan Zeng from Burton High School with Wendy's poster at the Intern Poster Session on campus this past August. Photo by Dena Proctor.

Interns Ready to Take on the World

The SEP Summer Intern program concluded its ninth successful year on August 21st with a poster session and reception on the UCSF campus. The interns displayed their posters for a gathering that included their mentors, teachers, and families, as well as María Santos, Associate Superintendent for Curriculum & Instruction, School of Medicine Dean Haile Debas, and Del Evans and Christine Riley of PG&E, who were on hand to deliver a generous donation to the Summer Intern and City Science projects. Ms. Santos was so impressed with the posters that she has arranged for them to be displayed at district headquarters downtown.

During their internships the twelve high school students and two teachers experienced many facets of the UCSF campus. "Learning how to use pipets, making solutions for experiments, and running gels are some of the things most of us, including myself, learned how to do this summer," wrote Kamilah Jones, a senior at Lowell High School. "Some people feel that it's not a big deal to know how to do these types of things, but everything I learned in the lab, no matter how small or big, it always kept me interested in learning

more about science." Intern Wendy Wandan Zeng of Burton High School offered her perspective: "This is a precious experience for me. I learned things that are not offered in high school, and this experience led me to think about my future career as being a scientist."

In addition to their summer research projects, the interns participated in tours of different areas of the University and discussed diverse research areas with several speakers, including Lane Conn, Michael Stryker, Beverly Wright, and Jim Mastrianni. We'd like to send thanks to these speakers for their time and effort, and to graduate students Diane Brown and Jennifer Dockter, who led wonderful tours of the Transgenic Animal Facility and the Gross Anatomy lab.

In addition to PG&E's donation, the Genentech Foundation and the French Foundation will each sponsor two new intern positions, which will open the program up to more deserving SFUSD students in the coming years. We'd like to remind SFUSD High School teachers that nominations for next summer's program will be due before winter break. Please keep your

eyes open for students who are excited about science and who you think will thrive in a UCSF research lab. Watch your school mailbox for announcements, and call Helen or Tracy if you have questions.

For their hard work and patience this summer, SEP thanks the interns, mentors, and principal investigators: Charity Arellano Ancheta and Cherrilyn Yamat of Mission HS; Wendy Zeng and Janel Tate of Burton HS; Sandra Rodriguez and Shaun Morris of Balboa HS; Michelle Chu, Nicole Wong, and Kamilah Jones of Lowell HS; Karen Win of Galileo HS; Mario Mercurio of School of the Arts; Michelle Lau of Lincoln HS; Patricia Kudritzki of Aptos MS; Larry Alegre of Cesar Chavez ES; Chris Franklin and James McKerrow, Dept. of Anatomic Pathology, VA Medical Center; Gabriele Bergers, Mike Rizen, and Doug Hanahan, Hormone Research Institute; Christelle Thibault and Michael Miles,

"Everything I learned in the lab, no matter how small or big, it always kept me interested in learning more about science."

Gallo Center, SFGH; Lily Hu and Dennis Deen, Brain Tumor Research Center; Lorraine Racine and Monty Bissell, SFGH; Siamak Baharloo, Nelson Freimer, and Bryna Siegel, Langley Porter Psychiatric Institute; Alice Wang and C.C. Wang, Dept. of Pharmaceutical Chemistry; Gail Cassafer and Cosmo Fraser, Dept. of Nephrology, VA Medical Center; Susy Choi, Seema Bhahtnagar, Mary Dallman, Brad Taylor, and Allan Basbaum, Dept. of Anatomy; Maradee Davis, Dept. of Epidemiology and Biostatistics; Andrea Cupp and Michael Skinner, Dept. of Reproductive Endocrinology.

And thank you to the teachers who identified and nominated so many talented, promising youth. In the words of intern Charity Arelleno Ancheta, "Thank you for seeing the potential inside of me."

Merck Bone Science Project Takes Off

Get to Know Your Brain with BrainLink!

BrainLink workshops, presented by SEP Coordinator Helen Doyle and neuroscience graduate students Erin Peckol and Kimberly Tanner, are free to all interested teachers, and are open to teachers outside of SFUSD. Teachers also receive about \$100 worth of materials after attending all four workshops. The curriculum, developed for elementary and middle school, includes Brain Comparisons, Motor Highways, Sensory Signals, and Memory and Learning. The lessons fit in great with SFUSD's 4th and 6th grade human body curricula, but teachers of other subjects have found the workshops fascinating and useful.

The BrainLink curriculum is interdisciplinary and easily incorporates math, language arts, and health with the science. The activities cover a range of neuroscience concepts, including why "practice makes perfect", how reflexes work, ways to improve memory, and how human and animal brains differ.

Upcoming workshops will be held at the California Academy of Sciences in Golden Gate Park on January 11 (Units 1 and 2) and January 25 (units 3 and 4) from 9am-2pm. A workshop will also be presented to the Bay Area Science Project teachers on March 14 at UCSF. Another series of afterschool workshops will be arranged in the winter and spring if teachers are interested. Helen and her colleagues may also be available to hold specially-arranged workshops for teachers throughout the greater Bay Area. More information about workshop schedules and content can be obtained by calling Helen at 502-6324.

Students in Marian Gonzalez physiology course at Lowell High School examine the form and function of the human knee.

SEP's fearless leader, Liesl Chatman, has a long-standing love of bones, as anyone who has visited the Resource Center and seen its extensive collection of skulls could tell. So when Merck Pharmaceutical Company wanted to donate funds to support bone science curriculum in the public schools, SEP was a natural recipient. With Merck's generosity and the help of two teachers from Lowell High School, Marian Gonzalez and Diana Lew, SEP will soon be able to offer kits to augment the teaching of bone science in San Francisco's public schools.

A kit of core materials is currently being piloted at Lowell and Galileo High Schools. Information from the pilots will be used to finalize the kit, and then a second kit will be purchased and made available for check-out. Currently available materials include:

Charts

*Vitamins and minerals
Foods for high performance
Hip and knee
Knee injuries
Spine disorders
Arthritis
Osteoporosis*

Models

*Fetal and adult skulls
Adult human skeleton
Herniated disc
Pinched nerve
Osteoporosis (kyphosis)
Bone structure
Auditory ossicles
Hip, knee, shoulder and elbow*

Activities and Equipment

*Sports and Food Curriculum
Calipers
Multimedia teen nutrition
Growth trends kit
Flexibility and strength kit*

Skeletons

*Pigeon, turtle, necturus,
rat and bat*

Miscellaneous

*Atlas of the Human Body
Bones: Unity of Form and
Function
Cartilage & bone histology
slides
Skeletal system overheads
X-rays
Calcium nutrition handouts*

The materials in the kits were chosen to support high school physiology courses, but will be available to any district teacher who is teaching about bones, the musculo-skeletal system, or related subjects.

SEP is also looking for volunteers from UCSF to work with teachers and students on bone science. If you work in orthopedics, nutrition, physical therapy, or other fields related to bone science and would like to contribute some of your time to public education, we can use your help! For information on checking out the materials or volunteering in the classroom, contact Tracy.

Desperately Seeking Science Projects

SEP's high school programs coordinator, Tracy Stevens and SFUSD's Secondary Science Resource Teacher, Len Poli are hoping to stir up some partnerships between SFUSD high school science teachers and UCSF volunteers, and to provide access to new hands-on projects for high school science classes at the same time. We are looking to design six to nine quick (one or two class periods) science activities that would complement the high school science curriculum, be valuable for teachers and students, and provide structure for scientists who may want to volunteer in the schools, but have little idea what to do. We are currently soliciting ideas for activities. After the activities are chosen, we will put them into a user-friendly format and gather the materials needed to implement them in the classroom. When everything is ready, we will host workshops; teachers and scientists will be able to work together, get experience with the activities, and give us feedback on how to improve them.

If you are a high school science teacher with ideas for activities that you would like to see implemented in the classroom, but haven't had the time or resources to develop, or if you have a place in your curriculum that cries out for some hands-on activities, we need your input. Likewise, if you are a scientist with a really cool way of demonstrating a scientific concept, which could be adapted for hands-on use in the classroom, let us know. Either way, contact Tracy Stevens at 502-5137, and we'll try to turn your ideas into action!

Triad participants, staff, and Willie the Wonder Dog gathered during the first workshop this past October at Marina Middle School.

Burbank, Denman, Lawton, & Mann Join The Women's Triad Project

After a strong recruiting effort, the Women's Triad Project has begun its third year and expanded as planned to twelve middle school sites. A key component of the Project is two scientists and one to two teachers working at each school site to coordinate science clubs targeted toward girls. Clubs range in size from 10 to 50 girls with the average size being 25. After a competitive application process, the following schools were named as new Triad sites: Luther Burbank Middle School, Denman Middle School, Lawton Alternative School, and Horace Mann Middle School. Sixteen new scientists were also selected through a competitive application process.

This year's schools, teachers, and scientists are: Aptos MS: Jane Gerugthy and Patricia Kudritzki with Erin Peckol and Kimberly Tanner; Luther Burbank MS: Kim Coates and Julie Habeeb with Erin Lopes and Karen Oegema; Gloria R. Davis MS: Emma Jones and Mishwa Lee with Julia Owens and Cari Whyne; James Denman MS: Elisa Poulos with Sandra Canchola and Tiina Sepp; Francisco

MS: Kristen Sorensen with Deda Gillespie and Sarah Mutka; A. P. Giannini MS: Cathy Christensen and Erla Hackett with Ellen Kuwana and Emily Troemel; Dr. M. L. King, Jr. MS: Ann Dee Clemenza and Susan Floore with Rachel Brem and Cynthia Fowler; Lawton K-8 Alternative School: Marge Hazelton and Marlies Lewis with Pam Blumson and Victoria Carlton; Horace Mann MS: Debbie Farkas with Patricia Caldera and Emily Walsh; Marina MS: Lorraine Perry and Julie Zastrow with Monique Hultner and Lisa Kim-Shapiro; Presidio MS: Carol Cockburn and Irene Hirota with Sumita Chowdhury-Ghosh and Fay Shamanski; SF Community: Judy Logan with Tejal Desai and Katy Korsmeyer.

Classified Ads

WANTED: Anatomical models for the SEP Resource Center.
WANTED: Modems for schools.
WANTED: MACINTOSH computers, (SE and newer), for schools
WANTED: IBM computers (especially 386 models) for schools.
WANTED: Blood pressure cuffs for the SEP Resource Center.
WANTED: Plastic petri dishes, any size, for teachers.



Events Calendar

November 15-17..... Triad Fall Retreat
November 28-29.....UCSF Holidays, SEP Closed
December 16.....Triad Workshop
December 23-January 1..... Winter Break, SEP Closed
January 10.....SFUSD Professional Development Day
January 11 & 25.....BrainLink Workshops, Cal. Academy