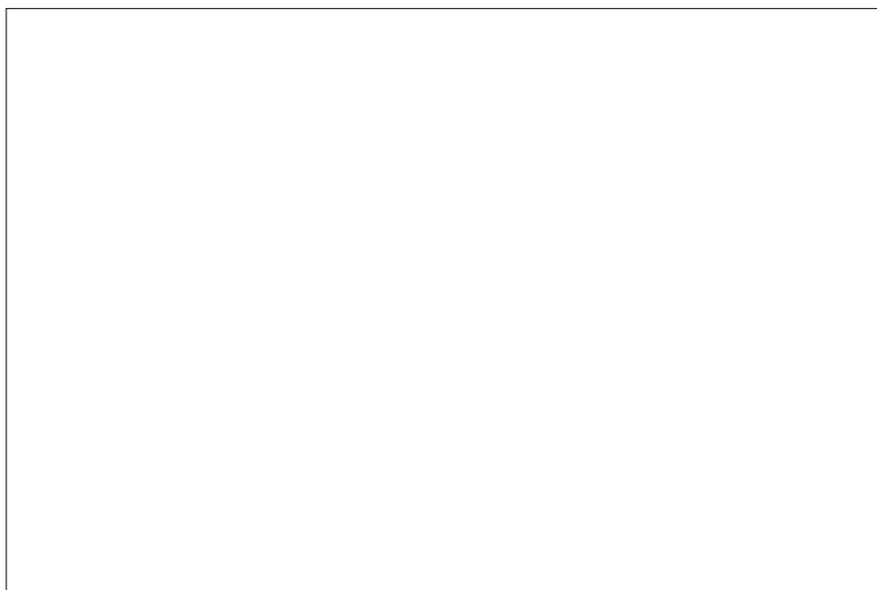


SEP Newsletter

Spring 1998 • No. 32



Students from Redding ES find joy in dry ice during a Lesson Plan Contest presentation given by students from Francisco Middle School. For Contest results, see page 4.

developing their own resumes. The second pilot program, *Career Shadowing*, is shorter but more intensive. Each spring, students investigate a career under the direction of their teacher and then shadow an individual who works in that field to get a first-hand view of the endeavor. These Career Shadowing experiences have evolved over the past two years from one hour of contact to 30 hours of job-site interaction between student and mentor.

Two smaller mentoring programs have been piloted by individual teachers. The first program sends teams of 3-4 chemistry students for 1-3 hour visits to labs at UCSF where they interview their hosts about the projects that go on in the lab and learn about the roles that chemistry plays in the investigations. This program has been active at Lincoln HS through Jonathan Frank and JoAnn Knecht and at the International Studies Academy through Dave Ausley. The second program, piloted by Allison Rowland at Mark Twain HS, centers around email correspondence between biology students and investigators at UCSF to put a real-world spin on what the students are studying in biology class.

Mentorship experiences such as these open up the workplace to the students by taking the world of work out of the imagination and into reality and by providing richer insights into careers than can be gained from the classroom, books, speakers, or the internet. Students also learn the

(Mentorships continued on back page)

Mentorships Expanding

A frequently heard comment from students is, "What is the value of this class to my life?" Real-world experience can go a long way toward answering that question. Recently, the San Francisco Unified School District has piloted several mentorship programs for high school students that provide them with experiences which connect skills and knowledge learned in school settings to their value and application in career settings. These kinds of efforts are commonly referred to as School-to-Career (STC) programs. SEP has been working

closely with high school educators through the following STC programs and during the past year has recruited 95 UCSF mentors who have worked with approximately 200 students.

Alex Insauralde and Anna Maria Vacaro, both teachers at Thurgood Marshall Academic High School (HS), have piloted two different models of STC programs. The first pilot, known as *Career Mentoring*, is a program of monthly, student-mentor meetings. At these meetings, students learn about the education and career pathways pursued by their mentors, and work on

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About SEP

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 for all students in San Francisco's public schools and to serve as a national model of partnership. Programs include partnerships between UCSF volunteers and SFUSD teachers, MedTeach, the Triad Project, the operation of a Resource Center, the Student Lesson Plan Contest, equipment and supply donations to schools, and internships for teachers and high school students. SEP also supports SFUSD programs including City Science and SF Base. SEP is an Academic Unit under the UCSF Office of Student Academic Affairs and is made possible in part through funds from NSF, NIH, the Howard Hughes Medical Institute, the UC Office of the President, the UCSF Chancellor, Genentech, and private donations.

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Summertime in the City

For many teachers, summertime provides an opportunity to meet with colleagues, reflect on their work, and develop new ideas through meetings, workshops, and institutes. In SFUSD, teachers may choose to take part in a myriad of summer workshops, curriculum development projects, summer school, or mentorships. Many of these are extensions of ongoing school year projects and provide opportunities for teachers to learn and share things they can use in their own classroom. Some of these projects, such as the City Science Summer Institute, involve UCSF scientists as part of the ongoing partnership between UCSF and SFUSD. Here are some examples of what science activities are happening in the District this summer:

SFUSD Summer School

Summer school provides students with free enriching instruction and provides teachers a more relaxed teaching environment. Classes in many subjects and grade levels offered. June 15-July 10 at District

sites.

SFUSD New Teacher Induction

A series of workshops on SFUSD's policies, curriculum, and goals for teachers newly hired by the District. June 15-July 2, HS; June 15-July 10, ES and MS, at District sites.

City Science Summer Lab for Learning

The Summer Lab for Learning is an elementary summer school program that brings students, teachers, and scientists together to explore science

concepts and important issues in science education. June 5 - July 10.

City Science Summer Institute for Beginning Teachers

The City Science Summer Institute is designed to provide an entry level understanding of science content, science process, and

classroom management for beginning elementary teachers. August 3 - 7 and August 10 - 14, all day.

5th and 8th Grade CSIAC Assessment Scoring

San Francisco is an integral part of an innovative program to develop and test a new hands-on assessment tool to assess science learning. The student assessments are scored by panels of teachers and scientists who are trained in the challenging process. August 4 - 8, all day.

SF BASE Biotechnology Education Workshop

Middle and high school teachers can spend two weeks doing molecular genetics and biotechnology

experiments and developing these for use with their science students. June 8-19, all day, at San Francisco State University.

School-to-Career Partnership Summer Institute

Teachers, administrators, and community partners will plan and develop STC programs for high school students. June 8-12.

Science Education Research and SEP

SEP Journal Club

Last fall, the SEP staff initiated a Journal Club modeled on the journal clubs of research labs where the assigned person chooses a topic and appropriate articles to read and discuss. Our goal was to become more familiar with science education literature and research by designating a time every two weeks where we would discuss the big issues and questions separately from our day-to-day interactions about projects. Now that the SEP Journal Club is off the ground, we'd like to extend an invitation to others from the UCSF and SFUSD communities who'd like to join us. We meet every other Friday at 11:00 till 12:30 or so at UCSF. We encourage folks who are interested to join us and share their ideas. Please contact Helen Doyle for an updated schedule or information.

This past year, SEP Journal Club topics have included *Project 2061: History and Goals; What is Inquiry and What Does It Look Like?*; Performance- Based Assessments and the California Systemic Initiatives Assessment Collaborative (CSIAC); the Role of Scientists in Professional Development of Teachers; "Sputnik" Revisited; Virtual Communities as a Place for Teacher Professional Development; the *Third International Math and Science Study (TIMSS)*; and *Separated By Sex*, a report from the American Association of University Women (AAUW) on single-sex classrooms. The group is open to fresh ideas and input; topics might include the controversial upcoming Proposition 227 about bilingual education or the development of new California State

Science Education Research Club at UCSF

Science Standards.

This spring SEP also began holding Science Education Research Club meetings with the goal of providing a forum in which scientists can investigate and discuss aspects of science education. In February, a group of UCSF scientists tried out the lifeboats activity from the *FOSS Variables* kit, part of the SFUSD fifth grade science curriculum, and compared it with a free-form extension on floating and sinking. The question posed was: How can the kit be extended so that it is more like science as it is really practiced? Interestingly, the room was silent as the scientists worked through the structured lifeboats activity but lively discussions sprung up during the free-form extension.

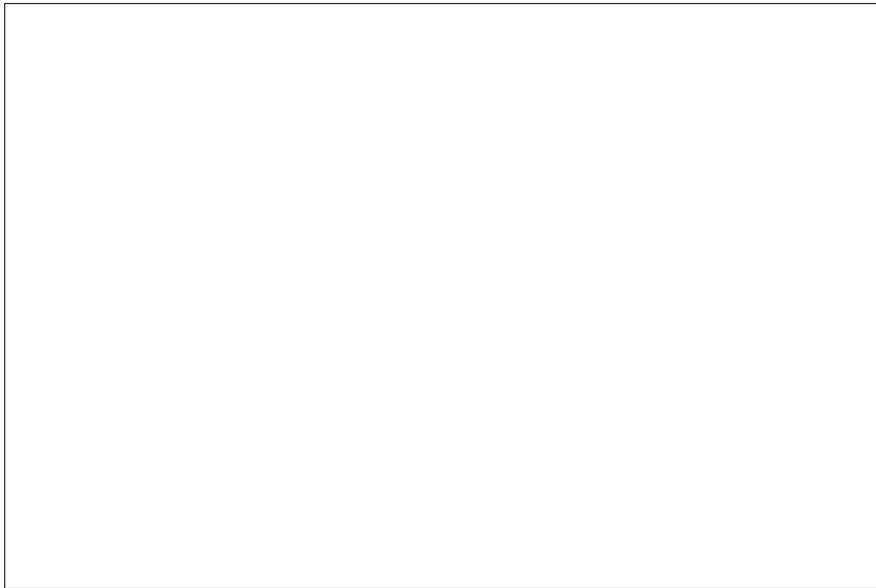
In March we repeated the activity with a group of fifth graders and then compared the approaches of the students with the scientists. The fifth graders were quicker to lay their hands on the materials and the scientists were quicker to discuss the activity. In April a group of scientists took part of the fifth grade CSIAC

performance-based assessment and then discussed the scoring rubric. The question posed this time was: Do tests like this one actually measure what we

intend them to? Incidentally, the scientists often noted that their answers would not have scored at the top of the scale.

The next meeting of the Science Education Club will be on Tuesday, June 9 at 7:00 PM on the UCSF campus in room C130. The topic will be "Identifying Process Skills Used in Science". The participants will be presented with a series of activities and will be asked to identify what science process skills they used in the activities and further; what science process skills do they use in their work. The meeting is open to all. RSVP to Erik Wilson or Erin Strauss.

Sandy Canchola, an SRA from the Ralston lab and Ace SEP Volunteer, assessed her knowledge of friction as she took part in a CSIAC assessment activity during a recent Science Education Club meeting.



The Middle School Division 1st Place team from Horace Mann MS teach 5th graders at E.R. Taylor ES about disabilities.

Mann & Lowell Take Honors in the 1998 SEP Lesson Plan Contest

Many teachers who sponsor Lesson Plan Contest (LPC) teams report that participating students gain leadership skills in addition to their knowledge of science and teaching. Ronna Voorsanger of Roosevelt Middle School (MS) had her 6th grade classes enter the contest this year; eight of those teams were selected as finalists to teach their lesson. Ronna reports, "The students seem different in class after they've taught their lesson. They seem more mature and confident." As her student Ivan Ly wrote after teaching a lesson at Frank McCoppin Elementary School (ES), "It was fun and interesting. On that day, I was so nervous, but now I got the experience so now I am not nervous."

Several teachers have made the annual LPC into a class-wide project. Kristen Sorensen, 6th grade teacher at Francisco MS, arranged for all her teams to teach their lesson to elementary school students through her school's service learning project. One morning, Kristen arrived at Jean Parker ES with a dozen 6th grade students

who taught different lessons in three classes. Though only one of those teams was a finalist in the LPC, all the students benefited from the experience.

"I learned that it's hard to be a teacher. You have to know what you're doing and what to say."

Ms. Sorensen asked her students, "How have you learned to be a leader through teaching your lesson to the elementary school students?" Some of their words follow: "What I learned is to work as a team and that it takes a lot of time to plan a lesson and that getting a class to pay attention is really hard."

"I learned that it was hard to teach elementary kids. You had to plan out everything for a day. Now I know how hard it is being a teacher."

"I learned that it's hard to be a teacher. You have to know what you're doing and what to say. So, I guess the experiment of teaching elementary kids is kind of hard and kind of fun."

"From the teaching, I learned that if you are kind to them, they will listen to you and do what you want them to."

"I want to be a teacher when I grow up."

Winners were announced on May 11 at the Awards Ceremony at UCSF.

Middle School Division

1st Place: Learning About Disabilities, Lora Albrecht, Mackenzie Oppenheim, Irene Deveyra, Kelly Allegretti, Horace Mann Academic MS, John Rivera. **2nd Places: Fun With Dry Ice**, Christina Hernandez, Reyna White, Jenny Gui, Jonathan San Juan, Jack Shanahan, Francisco MS, Kristen Sorensen; **The Huff and Puff Lesson**, Stephen Woo, Wilson Ly, Trevor Diep, Dominic Wu, Jonathan Arban, Roosevelt MS, Ronna Voorsanger. **3rd Places: Seeing Is Believing**, Vanessa Espinoza, Maribel Gutierrez, Shawnta Nutting, Deborah Watson, Gloria R. Davis Academic MS, Mishwa Lee; **Ratty Insides**, Wayne Gatlin, Jr., Anson Ha, Jason Yang, Nathaniel Edelman, Roosevelt MS, Ronna Voorsanger; **Explosion In A Bottle**, Colleen Fewer, Judd Anderson, Holly Doudiet; **Witch's Potion**, Victoria Kung, Elizabeth Woo, Lauren Yee; and **Mystery Pens**, Rhee Chu, Maylin Jue, Kim Hom, all three of Presidio MS, Irene Hirota.

High School Division

1st Place: Water Here, Water There, Water Everywhere, Julia Vexler, Charlie Yang, Elizabeth Hom, Diana Pogradichnaya, Thaihoa Tran, Lowell HS, Jim Carmack. **2nd Places: Poison Oak, The Beautiful Danger**, Zhi Heng Shirley Chen, Nancy Min, Xian Chui, Vera Pui, Yin Chio, Abraham Lincoln HS, William Milestone; **Ice Cream, You Scream, We all Scream for Science**, Melissa Fong, Christine Ou, Grace Li, Shirley Leung, George Washington HS, Daryl Zapata. **3rd Places: How Does Air Pressure Work?**, Patty Heng, Wing Chee (Kitty) Wong, Dollies Poon, George Washington HS, Diana Hamil; **How Healthy is our Water?**, Felix Wong, Alex Wong, George Washington HS, Clark Soave; **The Scientific Method**, Sunny Cheung, Alvin Cheung, Tung-Tai Hsia, George Washington HS, Paul Koski; **Exploration of Conductivity**, Jennifer Mok, Doris Yeung, George Washington HS, Paul Koski; **Twister**, Gordon Moy, Victor Suen, David Luong, George Washington HS, Clark Soave.

City Science Meets Neuro Science

What do the worlds of the neuroscientist and the elementary school teacher have in common? It may be hard to imagine. In a cultural encounter that brought to the surface the shared questions, interests, and passion for learning inherent in these two communities, however, a group of UCSF neuroscientists and San Francisco elementary school teachers found themselves engaged in a morning-long dialog about science, learning, and the nervous system.

On Saturday, February 7, a group of twenty-eight teachers spent a morning “doing research” in seven of UCSF’s neuroscience labs. Groups of four teachers and their scientist hosts explored what we know and are trying to find out about the nervous system and how it works. The groups investigated the tools and models used to answer questions ranging from how the brain changes as a result of experience or learning, to how the nervous system generates and regulates behavior.

In a number of groups, participants found themselves wrestling with their very definitions of what it means to learn. Teachers tend to think of learning as a cognitive process in which an individual incorporates new knowledge or insights into their personal conceptual frameworks. In the teachers’ world, learning implies thinking. Many of them were surprised by the scientists’ need to approach the concept of learning in simpler, more measurable terms, such as an organism’s ability to improve its performance on a physical task. This resulted in deep discussions about the nature of scientific research and the patience required to find meaning and satisfaction in the incremental gains in knowledge that research brings.

The teachers and scientists also found themselves delving into ethical questions about using animals in our efforts to better understand ourselves. Whether working with nematodes, rats, birds, or monkeys, the teachers appeared to be acutely aware of our human tendency to employ other

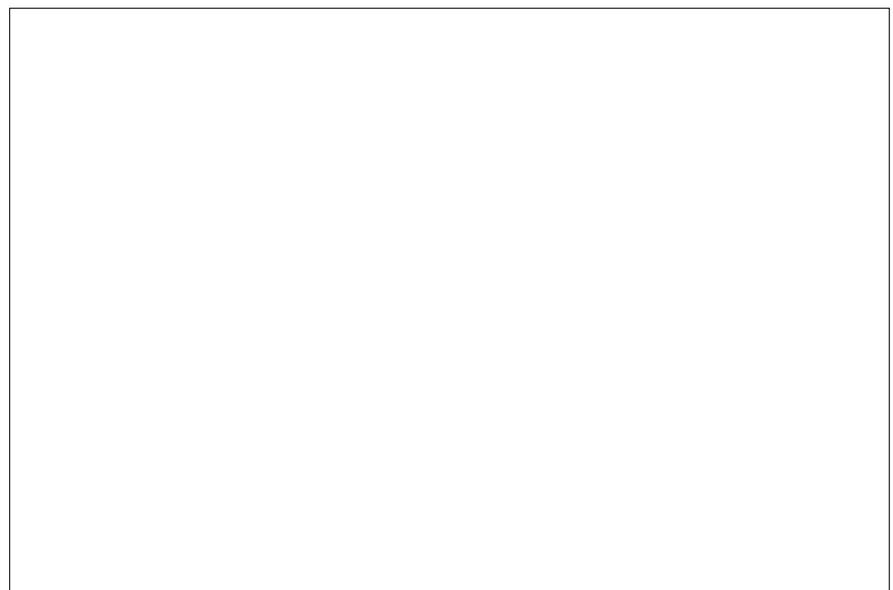
species in our own quest for knowledge. While several teachers came to the experience firmly believing that the costs of animal research were too high to justify the gains, most left with a growing understanding that the issue is not as simple as it first appears. As one teacher reported, “Today’s session made me think differently about using animals in lab research. I still feel a bit queasy and bad about it, but it helps to put faces and names on the researchers and on those being researched.”

As the day came to a close, one thing became eminently clear – both scientists and teachers benefit from spending time together sharing their interests and expertise. In the debriefing session that followed the time in the labs, it was a pleasure to watch the faces of the scientists as they listened to the teachers share their experiences and new understandings. Such a short encounter does not provide a newcomer to the field of neuroscience with the vocabulary required to report back using all the appropriate scientific language. Nevertheless, the scientists were delighted by the “relentless” questions, enthusiastic feedback, and clear verbalization of new insights from the

teachers. The following comment captures their sentiment and speaks to the joy that can be found in sharing one’s passion with an interested audience, “The teachers were great: enthusiastic, fun, curious. I particularly enjoyed the wrap-up session. Their comments really helped to re-enthusiasm me about my work and that of other neuroscientists.”

The teachers also spoke eloquently about the benefits they accrued from their morning in the labs. They were thrilled by the opportunity to actually perform tasks in the labs and appreciated the freedom to ask anything regarding the topic at hand. They were exposed to materials and procedures to which the average person does not have access. They were impressed by the knowledge, experience, curiosity and ingenuity of their scientist hosts. As one teacher reported, “I have a view of the campus from my house. For years I would look and feel pity for the people in the hospitals. Now when I see this view, I will rejoice in the thought of all the learning, research and discovery that happens here.”

SEP thanks the Bargmann, Dallman, Doupe, Edwards, Lisberger, Merzenich, and Ralston labs.



In Allison Doupe's lab in the Keck Center for Integrative Neuroscience, an elementary teacher prepares tissue sections of a finch brain to observe the region of the brain involved in bird song learning.

Report from the Field: Lawton Triad Club

The Triad Club at Lawton Alternative School has been active since the fall of 1996 when teachers Marlies Lewis and Marge Hazelton submitted a successful application to SEP. This year, the Lawton Team was joined by UCSF scientists Christina Cuomo and Dung Nguyen. Marlies and Christina offered the following thoughts on their experiences with Triad:

from the teacher perspective

This is my second year working with the SEP Triad Project in sponsoring a Girls' Science Club at Lawton Middle School. Of all the programs I am involved with as a SFUSD teacher, the Triad Project is the one I value most. Triad has helped me see more clearly gender inequity in my own classroom. I find myself discussing what I've learned directly with my students and sharing with them what I observe in our classroom. I believe that my heightened awareness of gender issues has helped my students to become more conscious of the roles they play, both individually and when working in groups.

I truly believe the club is positively impacting my female students. I sense their willingness to participate more, to take ownership of science

activities, and to see themselves as scientists and mathematicians. I spoke to some of the Lawton Triad girls and asked them why they had joined the club, if the club had met their expectations, and whether they thought the club was having a positive effect on them. The girls generally agreed that they joined the club initially because they thought it would be fun. They liked the idea of an all girls club where they "wouldn't have to make the boys be quiet and wouldn't have to do all the work." The club had, in many ways, met their expectations. It was fun. Their parents were impressed by what they were learning, and as one student expressed so aptly, "It tells people that women are scientists too."

I was most struck by what the girls said when asked what was different about being in the club versus being in the regular classroom. They all agreed that they did not like

to talk or raise their hands in the classroom because the boys made fun of them if they gave the wrong answer. "Some of the boys show off and put you down if the answer is wrong." In the club, things are different. The girls feel it is a safe place to offer opinions where no one will criticize them whether or not their answers are right or wrong.

Now, we must create a bridge between the Triad Girls' Science Club and the regular classroom and strive to create a safe learning environment

for both sexes, together.

from the scientist perspective

The enthusiasm and energy of girls in our Triad club continues to amaze me. For any activity we come up with, they are quickly absorbed in planning, debating, and executing their ideas. They strongly prefer working in small groups of two or three in which each person can have their hands on the materials throughout the activity, which is critical to engaging their attention and challenging them to think on their own.

In our club meetings we have covered a broad range of activities, each highlighting different goals for our girls. One week they extracted DNA from an onion, by following a scientific protocol. We further challenged them to work as independently as they could, before coming to us for help. In a different week, to target a different set of goals, the girls built marble mazes. Each group designed and built a maze and then reshaped it to create a slower path for a marble rolling down a tilted table. When challenged to work through a problem by trial and error, the girls created different styles of mazes, renovated

Irina Shukhat, a Triad Scientist at Lawton, employs her observation skills as a sleuth.

(continued on next page)

(Lawton Triad Club from previous page)

them subtly, or on occasion threw out their original idea and started from scratch. Throughout this activity they demonstrated the willingness to tackle a complex problem with courage and creativity.

One highlight of the year for me was bringing my Triad girls to visit my lab and those of two other Triad scientists. The girls thought everything in the lab was cool; everything I picked up they were curious about. Each Triad scientist showed them a bit of what they work with every day: from yeast to worms to zebrafish. The girls manipulated microscopes, loaded gels, learned some new vocabulary, and asked and answered lots of questions and much more.

My first year working with the girls in Triad was a very rewarding experience. I remember their excitement when they saw us come by the school for planning meetings, their enthusiasm and flashes of new understanding, and the moments when a shy quiet student would speak out in a large group. I found working with the girls fulfilling because I felt I was making a positive impact and giving them a unique experience and also because Triad is so different from day to day work at UCSF. Through working with the teachers on my team, attending Triad workshops, and interacting with the girls themselves, I've become more experienced in teaching, in watching your audience and drawing them out, in explaining science simply and without jargon, and in juggling everything you want to do to fit in the short span of an hour-long club meeting.

Triad is funded by the National Science Foundation Program for Women & Girls with additional support from SEP core funds and the San Francisco Unified School District.

When challenged to work through a problem by trial and error, the girls created different styles of mazes, renovated them subtly, or on occasion threw out their original idea and started from scratch.

(Mentorships from front page)
 importance of long-term planning for careers and that they need to work now to prepare for college and beyond. The student participants in these programs can also make valuable contacts to help them as they pursue education and careers in the years to come. SEP wishes to thank all of the individuals who gave their time to these valuable programs.

In the coming year, the District's STC programs will expand to four schools, which will at least triple the number of mentors needed for high school students. If you are interested in helping a high school student learn about careers in the biomedical sciences, contact Tracy Stevens for more information.

SEP Summer Hours

Over the summer, SEP staff keep varying hours and the Resource Center is closed except by special arrangement. If you need to visit SEP or are having trouble contacting a staff member, please call SEP's administrative assistant, Roberta Heidt, at 476-0300 to set up an appointment in advance. Roberta is available from 8:00 AM to noon, M-F.

Events Calendar

Last Day of School	June 5
SEP Science Education Club	June 9
City Science Summer Lab for Learning	June 8-July 10
School-to-Career Partnership Summer Institute	June 8-12
SF BASE Biotechnology Education Workshop	June 8-19
SFUSD Summer School	June 15-July 10
SFUSD New Teacher Induction, HS	June 15-July 2
SFUSD New Teacher Induction, ES & MS	June 15-July 10
Independence Day (SEP closed)	July 4
City Science Summer Institute for Beginning Teachers	Aug. 3-7 & 10-14

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