Techbridge Turns 10 in 2010!

techbridge talk

Techbridge

For families and friends of Techbridge

Fall 2010

chabot space & science center

Director's Note

Time does fly when you're having fun. The past 10 years have been an amazing time for me professionally as I've watched Techbridge grow from a local after-school program to one with national reach that encourages girls in technology, science, and engineering. Through partnerships, we are providing resources and training that extend the impact of Techbridge to thousands of girls near and far.

We are embarking on exciting projects in which we will bring Techbridge to new communities. Our partnership with Girl Scout councils is growing thanks to continued support from the **Noyce Foundation**. Also, a long-time dream of ours—to expand Techbridge beyond our local community—is getting a step closer with funding from the **Gordon and Betty Moore Foundation**. You can read more about these scale-up projects in our newsletter.

When I was a little girl I scavenged nuts and bolts from my dad's tool chest and made dolls out of them. I borrowed my brother's erector set to make furniture for my Barbie dolls. I was an engineer in the making, but just didn't know it. Without access to a program like Techbridge I didn't make the connection between these activities and engineering. For me it is rewarding to see girls in Techbridge get excited as they work on hands-on projects and meet role models who introduce them to new careers. Our girls hear the message that "Yes, you can be an engineer or computer scientist."

Please join us in celebrating a decade of services for girls and their families and in looking ahead to the next 10 years! ■

Trista Kekelis

Inside This Issue

Girls in the Techbridge Summer Academy were put to work at the Hidden Villa organic farm to learn about the science behind growing the produce that ends up on their table.

Techbridge Students Participate in Smith College's Summer Science and Engineering Program

Techbridge high school students spent four weeks this July at Smith College in Massachusetts as part of the Summer Science and Engineering Program.

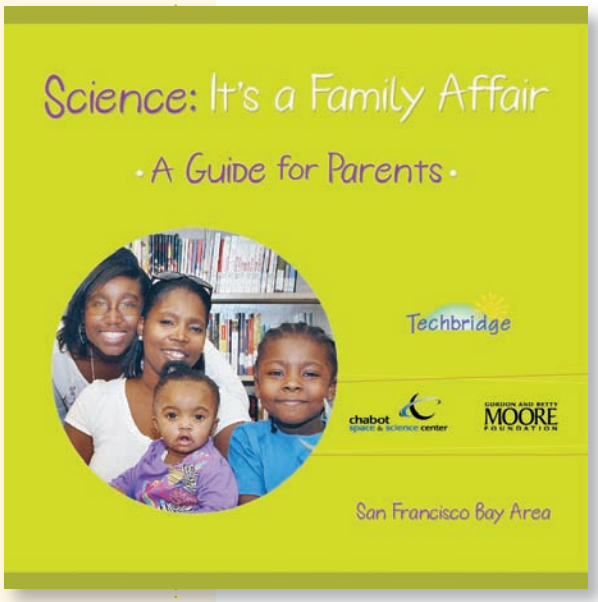
Five high school students who participated in Techbridge were lucky enough to be accepted into the Summer Science and Engineering Program at **Smith College**. For four weeks, Samantha Wang, Estephania Franco, Jessica Ortega, Eva Yeung, and Brenda Guttierez lived on Smith's campus in Massachusetts, took classes taught by the faculty, and bonded with other high school girls from around the world. Their participation in the program was funded by generous support from the **S.D. Bechtel, Jr. Foundation** and the **Bechtel Group Foundation**.

(continued on page 2)

Announcements

Science: It's a Family Affair

Our family resource guide for the Bay Area is out! This guide, which is for parents of girls and boys, offers tips on how to engage the whole family in the exploration of science. Also included are fun activities to try at home and scavenger hunts for the major science museums around the San Francisco Bay Area. Visit *www.techbridgegirls.org* for more details. We thank the Gordon and Betty Moore Foundation for its support on this project.



Girls Go Techbridge: Expanding our Reach

The Girls Go Techbridge program, currently in four Girl Scout councils across the country, is growing. With generous support from the Noyce Foundation, this program will expand to a total of 12 councils and promote five curriculum units over the next three years. With this expansion, more than 12,000 Girl Scouts will be inspired in science and engineering.

Techbridge Goes Big

We are extremely pleased to report that the Gordon and Betty Moore Foundation is funding a pilot scale-up of Techbridge in the Bay Area. Over the next three years, Techbridge staff will be researching, testing, and implementing methods to run Techbridge programs beyond our local community. Our goal is to develop a replicable model that can be rolled out to other communities nationally. We have received many requests from parents, teachers, and organizations that are interested in bringing Techbridge to their communities and look forward to this opportunity to support them in starting up programs for girls. Stay tuned for updates.

The New Face of Techbridge

Like the direction Techbridge is going? Then "Like" us on Facebook! Visit us at *www.facebook.com/techbridge* to see photos of our programs, updates on our projects and other items of interest to those supporting females in science, technology, and engineering.

Check Out our New Website

We are excited to announce the launch of our new website *www.techbridgegirls.org*, which has been re-designed to better meet the needs of the various groups we serve. Sections now include:

Families: Check our families' section for ideas and tips for encouraging science at home.

Role Models: Access our role model guide and toolkit, as well as tips for role modeling.

Educators: Check out highlights of our curriculum and information about trainings.

Girl Scout Councils: Learn about the curriculum and programs we are offering to Girl Scout councils.

For everyone: In Programs under About Us, see what's happening in each of our after-school programs and learn about our program model.

These sections will be expanded upon as we embark on new projects, so check back in regularly for updates! ■

Techbridge Students Participate in Smith's Summer Program

(continued from front page)

The girls were able to choose one college-level research course in addition to a writing course. Samantha chose a bio-medical engineering course, and particularly enjoyed learning about the auditory system. "One thing we learned a lot about was how the ear works and about cochlear implants. We got to visit hospitals as part of the course, too," Samantha told us on her return. Brenda and Eva took a course *By Girls, For Girls,* which focused on health issues facing young women. Estephania chose a *Women in Exercise* course and loved using the research labs for experiments.

The group returned home enthusiastic about their new knowledge, new experiences, and new friends. As Estephania told us halfway through the program, "I'm having a blast here at SSEP!" We look forward to a new group of Techbridge girls next summer having the same enriching experiences as these five girls. ■

Chew on This: The Science Behind Food

This year's Summer Academy, "Chew on This: The Science Behind Food" focused on the process it takes to make the food we eat every day. Techbridge girls explored the creation of chemical formulas to make food, the development of packaging materials, consumer research, and pricing and marketing strategies. Two programs—in Concord and Oakland—were hosted to accommodate all the girls who were interested in extending their learning into the summer.

Heather described the challenge of creating a product using limited materials and a restricted budget, two constraints the girls were exposed to when creating their own sandwich packaging.

Among other things, the girls learned about the complex journey food takes from being grown at a farm to served at a dinner table. Girls ran a relay race where they completed stations simulating farming, harvesting, processing, distribution and marketing. The girls attending the Summer Academy in Concord were able to see this process first hand when they visited **Hidden Villa Farm** in Los Altos and harvested and cooked their own lunch. Girls attending our Oakland Summer Academy got a different perspective on the development of food products for nationally-known brands after visiting the **National Food Lab** in Livermore.

Another highlight was a visit by role model, **Heather Fleming**. She led an activity where the girls designed packaging for a peanut butter and jelly sandwich. Heather shared that her work as a product designer allows her to travel and engage with people in different cultures. She described the challenge of creating a product using limited materials and a restricted budget, two constraints the girls were exposed to when creating their own sandwich packaging.

Techbridge girls use dry ice to carbonate root beer at the Techbridge Summer Academy in Oakland.

Techbridge alumnae also visited the Summer Academy and talked with the girls about applying for scholarships, picking a college, and overcoming academic challenges. Their visit made quite an impact. One seventh grade girl greeted her mom afterwards by saying, "We have to go home and start looking for scholarships. It is never too early. I have to practice writing essays so I can get scholarships to help pay for college."

The girls had a fun and educational time exploring science and engineering careers within food science. One student shared, "I think it was very informational and provided lots of fun activities. I thoroughly enjoyed being here and now I know what jobs I might want."

Techbridge thanks **Chevron** for its support for the Summer Academy. ■

◀ *Girls from Allendale Elementary School act as chemists and chemical engineers creating a lip gloss with just the properties they wanted: shiny, moisturizing, and bubble-gum flavored.*

▶ *Students at Korematsu Discovery Academy earn a Platinum TAGD certification on their model green houses, and along the way learn about civil engineering and LEED certification.*

Techbridge provides a bubble wand design activity at the Golden Gate Bridging event, which was a hit with Girl Scouts who participated.

Girls Go Techbridge Update

The Girls Go Techbridge partnership with Girl Scout councils across the country is growing. We've received scale-up funding from the **Noyce Foundation** to bring the program to a total of 12 Girl Scout councils over the next three years. Our team has been busy working on revising the current programs-in-a-box and creating two new units to share with councils.

Our partnerships with **Girl Scouts of Central Maryland, Girl Scouts of West Central Florida, Girl Scouts of Northern California** and **Girl Scouts of Central Texas** are encouraging girls in science and engineering in new and interesting ways. The Girl Scouts of Northern California brought the program boxes to girls whose families are migrant workers. The Girl Scouts of Central Maryland have been offering day long events using the boxes. Some girls have attended all three events and can't wait until they get the new units. The Girl Scouts of West Central Florida have used the boxes to create an event titled *Girl Today, Design Diva Tomorrow!* where girls learn about the engineering design process to create new innovative products. At the Girl Scouts of Central Texas, they have been working with organizations in their community this summer to bring the programs-in-a-box to hundreds of girls. They have worked with girls from groups like Heart House and the Boys and Girls Club. **Faith Brown**, COO of Girl Scouts of Central Texas shared, "Through the Girls Go Techbridge program we offered girls the opportunity to explore the world of engineering; many of these girls might not have had this opportunity otherwise. For example, Heart House of Austin is a free after-school program dedicated to providing a safe haven and academic support to low-income children and encouraging them to become good citizens." ■

Techbridge Participates in the Educate to Innovate Campaign

by Linda Kekelis

On July 19th, I was part of a convening of leaders of programs for girls and women in science, technology, and engineering that met in Washington, DC to develop recommendations for the Educate to Innovate Campaign launched by President Obama.

The goals of Educate to Innovate are to increase science literacy, improve the performance of American students in science, technology, engineering and math (STEM), and expand STEM education and career opportunities for underrepresented groups, including women and girls.

It was an honor to represent the Techbridge team at this gathering that included representatives from Girl Scouts USA, Girls Inc., National Center for Women and Information Technology, Society of Women Engineers, National Women's Law Center, American Association of University Women, Association of Science-Technology Centers, and National Coalition for Women and Girls in Education.

After presentations of the research and discussion, the convening group recommended five strategies to recruit more girls to science, technology, engineering and math. These key strategies included: 1) Help teachers engage and motivate all students, 2) Support programs that expose students to diverse role models and mentors, 3) Emphasize the awareness and adoption of new ways of teaching STEM that have proven to engage and recruit students, 4) Increase the number of TV programs that spark interest in STEM, and 5) Cultivate and support collaboration among groups, companies, and leaders working to increase and diversify the science and engineering workforce.

Techbridge looks forward to helping support the Educate to Innovate Campaign and hopes that its resources and lessons learned can help inform policy for the White House. ■

Emily Corwin, with Contra Costa Water District, visits Montera Middle School to explain her work and builds windmills with the girls to explore alternative sources of energy.

Techbridge Turns 10 in 2010!

Girls from Edendale Middle School proudly display their Road to Success board game that will help them reach their ultimate destination, college!

Top 10 Reasons Why Girls Love Techbridge

10. "It's a once in a lifetime opportunity."
9. "Thank you Techbridge for making me a better person!"
8. "Techbridge is a fun and wonderful after-school program that has given me many opportunities."
7. "Techbridge helped me so much with my communication skills and my confidence."
6. "Techbridge has helped me on my work at school."
5. "It is fun and exciting to participate in hands-on activities, go on field trips and learn what an engineer actually does."
4. "It's a safe place to explore things and develop skills...it's a place where if you mess up, it's okay."
3. "Techbridge has taught me if there is something I want to do, I can put my mind to it and do it."
2. "Techbridge gives us a real opportunity to learn more about science and engineering and think about our future career."
1. "Techbridge is much more than a science program. It is a remarkably tight-knit group of girls, determined to succeed."

Techbridge's Wish List for Its Tenth Birthday

As Techbridge grows, the list of needed supplies and materials gets bigger too. These are the things we would love most to help inspire girls. Will you help? For details on how to donate, see our back page.

- **5 lab coats** so future chemical engineers can explore the properties of polymers - $25
- **1 K'NEX set** for future civil engineers to build models of bridges - $50
- **1 class set of Blinky Robots** to expose girls to the excitement of electrical engineering - $100
- **15 LEGO solar panels** so a group of future environmental engineers can find the best design for a solar-powered car - $500
- **1 bus trip to an engineering firm** to expose girls to role models and career paths - $750

AIPCS II students jump in excitement to see their solar-powered LEGO cars race each other.

Montera Middle School students pose in front of a LEGO dinosaur on a field trip to Autodesk, a design software company.

Techbridge Develops New Partnerships

Field trips are the highlight of the year for many of our girls. This past year, Techbridge formed three new partnerships.

This spring, the girls from Oakland Unity High School were able to see firsthand the inner workings of one of the world's biggest social networking companies, **Facebook**. Getting the opportunity to meet the engineers, lawyers and developers at Facebook encouraged several of the girls to aspire to an engineering career.

Role models, **Rachel Araneta** and **Jamie Harris**, shared their personal stories that generated lots of questions. "Was school hard?" "Did you know this is what you wanted to do when you were in high school?" The

"I liked learning how to change 'people talk' into the 'computer controls' for the tortoise."

Unity girls were so excited to be at Facebook several of them posted pictures of themselves having lunch at the world-famous company on their personal Facebook accounts. The activities hosted on this trip helped the girls walk away with a better understanding of how social networks work and how to make their accounts safe for people to view.

This spring the girls from Montera Middle School had the opportunity to visit **Microsoft** at its Mountain View location, an event organized with **Avanade**. In the morning the girls focused on programming using Microsoft Small Basic. This tool gave the girls an opportunity to practice beginning computer programming skills. The girls were amazed to watch a turtle they programmed walk around the computer screen in a pattern they designed and programmed. One girl shared, "I liked learning how to change 'people talk' into the 'computer controls' for the tortoise." Another memorable part of the day was when **Mahnaz Javid**, Vice President, Global Learning & Development at Avanade, flew in from Seattle to share her life story of growing up in Iran and moving to the US to study in high school. Her message about the importance of perseverance was truly inspiring. The girls left Microsoft feeling more comfortable with computer programming and more interested in a career in technology.

Girls from Frick Middle School build solar cars with Stanford student, Sandy Huang.

Another partnership we developed over the past year was with **Stanford University's Society of Women Engineers**. Students from Frick Middle School visited the workshop of the Stanford Solar Car Project to see a car built almost entirely by undergraduates. The student engineers related the technology that went into building their vehicle by showing solar cells, samples of the incredibly strong fiberboard used for the body, and brand new electrical equipment designed just for this project. The girls walked away in awe of all that goes into designing a car and the variety of academic offerings an institution like Stanford can offer.

Thank you to all of our partners, both new and old, for hosting field trips and making the Techbridge experience such a rich and impactful one for our girls. ■

◀ *Arroyo High School students prepare their model, built of LEGOs and programmed with Pico Crickets software, to walk down the runway in their America's Next Top Robot competition.*

▶ *A student of Holbrook Elementary School uses visual and written directions to solder electronic components to the circuit board to create her flashing Blinky Robot.*

Spotlight on Alumnae

With a track record of 10 years, Techbridge is pleased to see its graduates go on to college and careers. We stay in touch through Facebook and share opportunities like scholarships and internships that may be of interest to our alumnae.

We also invite alumnae back to visit Techbridge as role models. We find that they enjoy the chance to reconnect and give back to the program. Our girls also enjoy the chance to meet the alumnae and learn about opportunities that await them. We are creating career cards that feature our alumnae and other role models. These cards are used in the after-school programs and serve as prompts that invite discussions about college and careers. If you are an alumna and would like to share where you are now and how Techbridge has influenced you, please write to *Techbridge@chabotspace.org*.

SARAH LEE

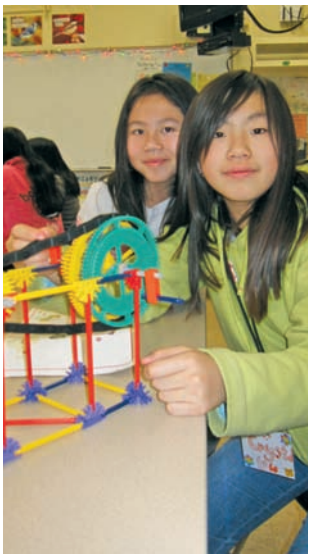
Sarah was in the Techbridge program at Oakland Tech, and completed her degree from UC Berkeley in Civil and Environmental Engineering this past spring. As she puts it, "Techbridge showed me how science and engineering are cool, and brought in role models to talk about career paths." Sarah took their advice to heart and explored different paths while interning for Bechtel and **Jacobs Engineering** during college. Now, she loves her job as a field inspector for Jacobs Engineering. "I am most excited about seeing the application of engineering on actual construction sites. I learned about methods and theories in college, but now I actually get to see them used." Sarah returned to Techbridge this year and shared her experiences with students at Allendale Elementary School.

PRISCILLA CHANG

Priscilla Chang is a second-year student at UC Berkeley. As a Molecular and Cell Biology major, she is fascinated with cells at the microscopic level. Meeting new people reminds her of her years in Techbridge, which brought together girls interested in science, technology, and engineering. Among the hands-on-projects, Priscilla liked building a green dollhouse the best. It incorporated the use of technology to design and plan the house, along with creativity and an engineering perspective to assimilate green practices and materials into her model. In recent years, Techbridge had helped expand her knowledge of jobs in the science field and informed her of helpful programs to further her interests. In the future, Priscilla is interested in researching microorganisms or working in the health field.

▲ *Techbridge students at Lincoln Elementary School dissect cow eyes with role model Cassie Byrd during a behind-the-scenes visit to the Exploratorium.*

▼ *Oakland Technical High School girls take apart old computers to investigate the hardware and learn how they work.*



▲ *Washington Manor students build a model of an elevator out of K'NEX and learn about simple machines.*

▲ *A student from Frick Middle School shows off the interlocking gears she assembled that power her gumball machine.*

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▶ *Students at Madison Middle School work on connecting sound cards to circuits to make stuffed animals that speak when squeezed.*

◀ *Bohannon students take pride in soldering the circuit boards for their Rockit Robots.*

▶ *Students at Glenbrook Middle School experience principles of aerospace engineering firsthand by building kites and flying them outside.*

▼ *Girls at Oakland Unity High School visit Lake Chabot to launch their underwater Remotely Operated Vehicles which they built using PVC pipes and thrusters.*

▼ *Girls from Esperanza Elementary School experiment with liquid nitrogen on a field trip to Clorox.*

Techbridge thanks its sponsors and field trip partners this year!

Sponsors: **Gordon and Betty Moore Foundation, Noyce Foundation, Stephen Bechtel Fund, Chevron, Yahoo! Employee Foundation, Cisco Foundation, Google, and Autodesk**

Partners: **Amgen, Apple, Autodesk, Carollo Engineers, Catapult Design, Chabot Space & Science Center, Chevron, Cisco Systems, Clorox, eBay, Exploratorium, Facebook, Google, IDEO, Intel, Intuitive Surgical, Kaiser Permanente, LeapFrog, Microsoft/Avanade, Stanford University, Stellar Solutions, Swinerton Construction, University of California Berkeley, UCSF DeRisi Lab, Valero, and Yahoo!**

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