

techbridge talk



For families and friends of Techbridge

Spring 2011



Director's Note

Techbridge embarks on a new venture filled with promise for growth and expanded impact. After 10 years as a program of Chabot Space & Science Center, Techbridge is spinning off from the Center this summer and is on its way to becoming an independent nonprofit. Techbridge will continue to offer after-school and summer programs for girls in Oakland and other East Bay communities. In addition, we are expanding services to meet the demand from educators and partners across the country to support their programming for girls.

We are grateful to Chabot Space & Science Center which has a long history of supporting youth through its programs at the Center and in the community. We thank its staff and especially Alex Zwissler (Executive Director and CEO) and Etta Heber (Director of Programs) who have supported our team throughout the years. Techbridge and Chabot Space & Science Center will continue to look for opportunities to partner on joint ventures to encourage

youth in science, technology, and engineering.

What's in store for Techbridge? In our first 10 years Techbridge has delivered a high touch, high impact program that has inspired many girls in our local community to see a future for themselves in science, technology, and engineering. We are committed to continuing to deliver a program that excites girls and expands their options for the future. Through partnerships with national organizations, we look forward to expanding our reach to girls across the country so that their ideas and talents can contribute to breakthroughs in science and technology. You can read about these projects in more detail inside.

Thank you for your continued support and friendship. We look forward to an exciting year ahead. ■

Jinda Kekelis



Chemical Engineering is one of our more popular units, and our Bath Salts activity is no exception. Girls at Korematsu Discovery Academy and Esperanza Elementary School learn about process flow diagrams and how to follow a procedure to complete a task.

Imagine that Every Student in Oakland had Quality After-school Science

Imagine that the next technology breakthrough is in the imagination of a student in Oakland. An after-school program could help unlock the talents of a budding computer scientist or biotech engineer. Techbridge, in partnership with the **Oakland Unified School District Afterschool Programs Office**, is one of two groups nationwide that received funding last fall to support just such a program. With funding from the **Noyce Foundation, The After-School Corporation**, and the **Collaborative for Building**

After-school Systems, Techbridge is supporting the development of city-wide efforts to increase quality science instruction in after-school programs.

"I loved learning new questioning techniques. LOVED getting 5 lesson plans!"

This new partnership provides professional development for staff leading after-school programs in Oakland elementary schools. (continued on Page 3)

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Girls at Glenbrook Middle School excitedly plan and program their Scratch animation project.

Imagine That! Linking Computer Science to Career Exploration

“It helped me think of my future. I would like to work as a computer programmer.” This reflection was written by a fifth grader following a field trip to Google’s Mountain View campus. With support from **Google** and the **Paul Scammell Foundation**, we hope to inspire even more girls to a career in computer science.

“It helped me think of my future. I would like to work as a computer programmer.”

This past year, we developed new curriculum in Scratch, a free program developed by MIT that teaches students the building blocks of computer programming. By connecting puzzle-shaped pieces together, girls can create animations with motion, sound, and even user interaction.

Did you know?

According to the NSF and NCWIT:

- In 2009, 18% of AP Computer Science test-takers were female.
- In 2009, women earned only 18% of all CS degrees. In 1985, women earned 37% of CS degrees.
- 25% of professionals in IT-related occupations in 2008 were female.

The girls at Glenbrook Middle School were challenged to use Scratch to tell a story about a problem in their community, and how an engineer or scientist might help solve it. One group programmed an animation about oil spills and environmental engineers, and another group used their animation to describe ecology and conserving our resources. Role model **Lucia Longhi** of UC Berkeley came to talk to the girls about her work as a computer programmer and to show the girls how cool her profession can be.

The percentage of women receiving undergraduate computer science degrees has been declining for decades. By offering experiences that promote creativity and tech savvy we hope to change the face of computer science and encourage Techbridge girls in studies and careers in new technology. ■

Developing the Next Generation of Science Teachers

Techbridge is pleased to announce a partnership with the **Alameda County Office of Education, Chabot College, and California State University, East Bay** that aims to improve science instruction and address the shortage of science teachers in the East Bay. This partnership is part of the SF-Bay Integrated Middle School Science grant funded by the **National Science Foundation**. The project’s goals are to research and promote best practices in science professional development for middle school teachers and ensure a pipeline of science teachers for the Bay Area.

Techbridge is helping support pre-service teachers as Program Assistants in our San Leandro and San Lorenzo schools. Techbridge after-school programs provide an ideal situation to learn how to teach science. With hands-on projects that excite students and role models who inspire, Techbridge provides the building blocks for holding students’ attention and promoting career interests in

science and engineering.

Program Assistants, **Darrian Perry, Emmanuel Brown, and TreVaughn Soriano**, are gaining valuable classroom experience working alongside Program Manager, Martha Pena. Martha provides support and training on the Techbridge curricula and coaches the Program Assistants on effective science instruction and classroom management. Techbridge classroom teachers at Bohannon, Edendale, and Washington Manor Middle Schools serve as mentors and provide additional support to the Program Assistants. Having the chance to observe classroom teachers and receive feedback is providing valuable on-the-job training. Emmanuel Brown shared, “This opportunity is very helpful. I’m learning how to give better directions for future classes.”

This partnership offers an exciting opportunity for Techbridge to support the next generation of science teachers. Perhaps one day these Program Assistants will be leading Techbridge after-school programs of their own. ■



TreVaughn Soriano works with girls at Edendale Middle School to build the game Mouse Trap before building their own Rube Goldberg Machines.



Girls Go Techbridge Welcomes Four New Girl Scout Councils

When the request for proposals went out in winter, we never imagined the response we would receive. We received 41 proposals from councils that wanted to bring Girls Go Techbridge to their girls.

We are pleased to announce that **Girl Scouts of Greater Los Angeles, Eastern Missouri, North Carolina Coastal Pines, and Colonial Coast** (Chesapeake Bay, VA) have been selected to partner with us in scaling up the project over the next two years. With Techbridge curricula and training, these councils will have the resources to increase their girls' interest and confidence in engineering and science.

The Techbridge team is developing two new programs-in-a-box that will be released in August to complement our existing programs. The new activities will promote collaboration and hands-on discovery.

Survival skills meet science in **Engineers to the Rescue**. In this unit, girls design water filters, wind-powered cranks, a message-carrying car, and safe shelter for a troop's camping

trip in Yellowstone National Park. By applying engineering and problem-solving skills the girls work their way to safety when an earthquake strikes. This unit also introduces the girls to role models from the **Society of Women Engineers** who show them how engineering can help make the world a better place.

In **ThrillBuilders**, girls learn about simple machines as they build a carnival, including a merry-go-round, a bean-bag toss, and a roller coaster car. Girl Scouts get the chance to engineer the ultimate playground as they learn how levers, pulleys, screws and gears make work easier.

Girls Go Techbridge is made possible by the **Noyce Foundation**. Ron Ottinger, Executive Director of the Noyce Foundation, shares, "The Noyce Foundation is committed to helping youth become thoughtful and engaged science, engineering, and technology savvy learners. We are pleased to support Techbridge in this scale-up project that is expanding opportunities for Girl Scouts to experience hands-on science in out of school settings." ■



Yaboo! opened its doors to Madison Middle School this fall for another inspiring field trip. Girls and role models took part in the Algorithm Workout activity, where girls had to write an algorithm for an exercise move and challenged their classmates to follow their program.

Imagine that Every Student in Oakland had Quality After-school Science

(continued from front page)

The program supports a Science Learning Community where a group of 30 staff meet monthly to network and learn promising practices for quality science in their programs. Members of this Science Learning Community learn how to promote inquiry, career exploration and family engagement. The program also provides coaching and follow-up support for introducing science activities.

Participants appreciate the new science activities that

they can bring back to their students and especially like the chance to try out the activities. Feedback on the evaluations of the trainings has been overwhelmingly positive: "My kids loved the Egg Drop. It was a great success and they all had a lot of fun."

We would like to continue this project and expand to support after-school science in middle schools in Oakland. Stay tuned to **www.techbridgegirls.org** for more information on this effort. ■



Two Junior Girl Scouts discuss their next step in constructing a circuit that will power a fan.



Students from American Indian Public Charter School II design a game similar to Operation®.

Future scientists at work...



▲ A student at Oakland Unity High School is thrilled to find her formula for a super ball was successful. Girls became chemical engineers as they performed systematic experiments to discover the right ratio of sodium silicate to ethyl alcohol to make the perfect ball.



▲ At Oakland Technical High School, girls learn about computer animation from storyboard to sound editing and create their own stop-motion animations. They followed up the project with a trip to Pixar Animation Studios to meet the engineers who work on animated films.

▼ Girls at Washington Manor Middle School put the finishing touches on a Rube Goldberg Machine. After learning about simple machines, potential energy and kinetic energy, these girls constructed a pulley as the final step in their machine.

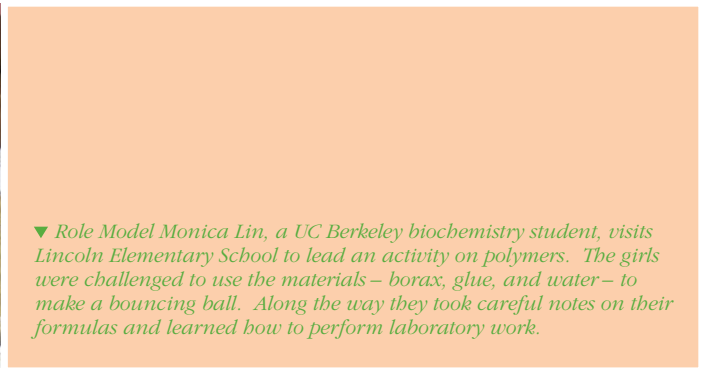


▼ Role model, Amy Connors of Stellar Solutions, visits Montera Middle School to talk about her work as an aerospace engineer. The girls designed stomp rockets and learned about Amy's work with satellites.

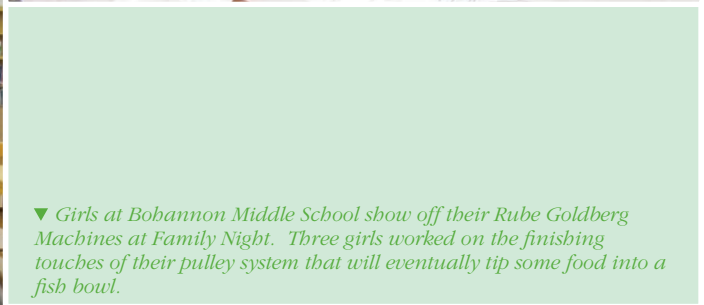




▲ At Allendale Elementary School, a girl makes a tray of watercolors that should make "The Techbridge Toy Company" a profit. Students learned about industrial and chemical engineering and discovered how to use this knowledge to make a product within a budget.



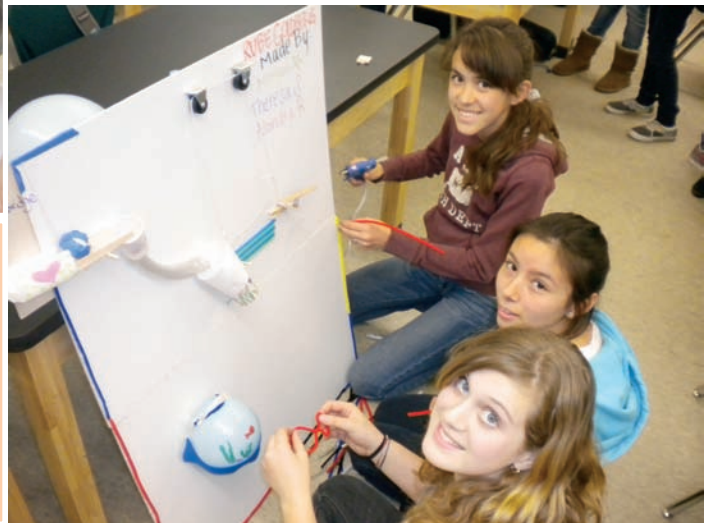
▼ Role Model Monica Lin, a UC Berkeley biochemistry student, visits Lincoln Elementary School to lead an activity on polymers. The girls were challenged to use the materials – borax, glue, and water – to make a bouncing ball. Along the way they took careful notes on their formulas and learned how to perform laboratory work.



▼ Girls at Bohannon Middle School show off their Rube Goldberg Machines at Family Night. Three girls worked on the finishing touches of their pulley system that will eventually tip some food into a fish bowl.



▲ Girls at Frick Middle School are challenged to think of a traditional gingerbread house differently this past December. The group learned about structural engineering as they competed to build the tallest structure they could using graham crackers and frosting, and added candy to test the strength of their structure.



Estephania's Story

In my high school years the program that most affected me has been Techbridge. Techbridge has been one of the best opportunities I have taken in my high school years. This program has showed me to believe in myself and have a lot of perseverance. Techbridge showed me that just because I'm a young woman interested like engineering, math, and science that are mostly male dominated I don't have to be intimidated by them.

This program has showed me to believe in myself and have a lot of perseverance.

When I heard about this program I knew I saw myself in it. I wanted to be challenged with the curriculum that it offered. We go on field trips that teach us about different careers that require pursuing a degree in science. Since I was young, I loved to learn about how things worked. In

Techbridge that's exactly what we do by - use engineering and math that everyone needs to be successful in the science field.

Techbridge has taught me to speak up and use the knowledge I've learned. Because I'm from a low income family, I don't have the money to go to expensive programs. Techbridge showed me that opportunities are around and all I need is to look for them. In 2010 I got a full scholarship to go to the Smith Summer Science and Engineering Program at Smith College in Massachusetts. I proved that even though I was considered low income I did have the same intelligence as them. I showed to my professors that just because I'm the first of my family to graduate and go to college doesn't mean I can't achieve the same as wealthier youth.

Through Techbridge I have outgrown my shyness. This program has helped me reach my goals has helped show the bright, confident, and working woman that I am. ■



Estephania works on her Rube Goldberg Machine during a Techbridge session at Oakland Unity High School.



Girls at Arroyo High School experiment with a physics activity. After cutting a crazy shape and attaching weights to one part, they were challenged to find the center of mass of the board in several different ways.

Techbridge Student Wins NCWIT Award

Techbridge is pleased to share that Ana Peña, a third-year Techbridge student at Oakland Unity High School, was honored at a luncheon for young women for their computing-related achievements and interests. The Aspirations in Computing, Bay Area Affiliate Award is given by the National Center of Women & Information Technology (NCWIT). The recipients are selected for their interest in IT, leadership ability, academic history, and plans for

post-secondary education.

Ana was thrilled to walk away with a \$250 gift card, flip camera, iPod Touch, and a day at Google. "Techbridge is the reason I heard about this award," she said.

The event celebrated the girls' achievements and provided an opportunity for the winners to network with role models from leading tech firms in the Bay Area. We can't wait to see what the future holds for Ana and the tech industry! ■



Ana and her parents celebrate at the NCWIT Aspirations in Computing Award ceremony.



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 learn about opportunities that await them. If you are an alumna and would like to share where you are now and how Techbridge has influenced you, please contact us.



MARIA ALVARADO

I participated in Techbridge at Oakland Technical High School. Now, I am a fourth year electrical engineering major at **U.C. Davis**. Techbridge exposed me to breadboards and soldering. I am able to use skills from these projects in my upper division engineering courses where I work in-depth with circuitry and signals. Most students in my classes have never been exposed to either one and I feel appreciative for what Techbridge taught me.

With the role models I met through Techbridge, I learned about different projects they worked on. Field trips to engineering organizations like IDEO and the Jet Propulsion Lab inspired me even more to continue my journey in becoming an engineer and helping improve society. I am currently involved in U.C. Davis's Society of Women Engineers and the Cal Aggie Marching Band! I have also been a role model for Techbridge, giving back to encourage the next generation of engineers.



ANA LOPEZ

I am a second year civil engineering student at **Cal Poly, San Luis Obispo**. I was a member of Techbridge for three years at Oakland Unity High School. Techbridge has been one of the most wonderful things that happened to me. It was not only a fun program to do after school, it provided guidance that helped me choose what I want to do with my life. Before Techbridge I had the dream of becoming a lawyer, but Techbridge helped me realize that my passion for science and mathematics was greater.

When I decided to major in civil engineering, I knew that it was going to be a challenging major and career, especially since there still aren't enough girls in the field of engineering. I have learned that it is very important to remain motivated and committed because that is the only way you will succeed. I have learned that there is no such thing as giving up. I'm so glad that Techbridge helped me realize that engineering was the choice for me.



▲ eBay opens its doors to Edendale Middle School to give girls an inside glimpse at the online auction site. After participating in a mock auction girls worked with role models to design their own webstore.

▼ Girls from American Indian Public Charter School II watch a test tube of evidence change color after adding an indicator chemical. Students became forensic scientists when solving the Case of the Missing Puppy.



▲ How do simple machines, the engineering design process, and potential energy come together in Techbridge? With catapults! Girls at Lincoln Elementary School test how far their device can launch a ball.



▲ Girls at Holbrook Elementary School gather excitedly around a classmate reading a Role Model Career Card. After hearing about what Material Science Engineers do, they played Pictionary and learned about engineering careers.



Techbridge thanks its sponsors and field trip partners this year!

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Want to Know More?

www.techbridgegirls.org
510.777.9170

► A student at Glenbrook Middle School carefully dissects a model car to see what makes this toy work. Afterwards, she was able to explain how the gears worked together to link all the moving parts to the wheels.



▼ Mount Diablo High School students visit Intuitive Surgical to learn about their biomedical devices. The girls even got to try out their daVinci robotic system, where the tiny tools are controlled using hand controls at a separate console.



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To donate, make checks payable to Chabot Space and Science Center, and designate "Techbridge." You can send them directly to Techbridge at the address at left. We thank you for your support.