



# COMMUNITY RESOURCES FOR SCIENCE NEWS

Empowering teachers and scientists to inspire young learners

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## Observation Leads to Wonder Through Scientific Sketching

Can you draw the wind or the scent of a rose? Can you describe in words the intricate patterns on a seashell or a feather?

Throughout history, scientists have relied on both written text and sketches to convey their ideas, note their observations, and ponder new questions. For some tasks, words alone suffice, while for others a simple hand drawn sketch will more effectively record the essential information. And, quite often, a little bit of both are required.

Drawing (literally and figuratively) on the science notebook practices of famous scientists and naturalists, CRS has been working with teachers and partner organizations to explore strategies for including observational drawing as a component of student science lessons. In addition to professional development workshops, CRS has been working this year to develop specimen kits featuring animal bones and skulls, seeds, minerals, insects, and other interesting natural objects for use in classroom lessons.

To give young students an opportunity to learn about how modern day scientists use sketching and science notebooks in their own research, CRS recruited and trained a team of UC Berkeley graduate students to present science sketching hands-on lessons in nearly every 4th and 5th grade Berkeley classroom. Supported by funding from the Berkeley Public Schools Fund and the UC Chancellor's Community Partnership Fund, this project is bringing graduate students from STEM departments including Integrative Biology, Plant & Microbial Biology, Chemistry, Environmental Engineering, and Earth & Planetary Science into local schools.

Each graduate student used their own unique perspective and expertise to craft a lesson to immerse students in an engaging

scientific sketching activity. For some lessons, students drew maps, studying the landscape and available routes to predict where they might search for the next Tyrannosaurus Rex fossil. Some lessons looked at the variation within leaves found on the schoolyard to gain an understanding of local plant adaptations. And other lessons brought the students outside with their science notebooks to observe and discover the variety of living organisms right outside their classroom door.



Students sketch observations in science notebooks.

Explains CRS Senior Volunteer Manager Traci Grzymala, "Though incredibly varied, all the lessons aimed to show students that when you take the time to sketch something, a drawing provides you with the space and context to truly understand it. It invites wonder, and enables the creation of truly meaningful connections."

During the school year, CRS facilitated time for the Berkeley elementary science specialist teachers to explore resources, share effective strategies, and help develop the set of reference materials, sketching lesson plans, and specimen kits that will be available for use in elementary classrooms across the entire district. Grant funds also provided each school site with a set of basic supplies such as colored pencils and sketching paper.

A highlight of the teacher professional development this year included a session with scientific illustrator Katie Bertsche, one of CRS' partners from Science@Cal. Katie provided an in-depth lesson on lines and texture as foundational to success with observational sketching.

Teachers describe scientific sketching as a powerful exercise for getting their students to observe details, develop skills in communicating important information, reflect on what they already know and what they are curious about, and to make connections as they learn about the world they live in.

## Educators Transform Teaching, Share Success Stories in Science

"When students begin to make connections with each other, as well as with their data, they begin to question what they think they know and become stronger critical thinkers," says one elementary teacher in Oakland, describing her efforts to strengthen science teaching and learning in her classroom.

This teacher is one of 76 educators in Oakland, Berkeley, Richmond, and other East Bay communities recognized by CRS this Spring for excellence in elementary science teaching. An impressive 38 of these teachers earned the highest recognition as Trailblazers in Elementary Science Teaching and Learning.



Students at Allendale Elementary enjoy a special Day of Science Science Super Star prize! Allendale is one of several OUSD schools getting a special Day of Science event.

To earn recognition in the CRS Science Super Star Challenge, teachers document how they meet a carefully crafted set of best practices including leading their students in hands-on investigations, beyond-the-classroom explorations, and reading and writing about science.

"These teachers exemplify dedication to ensuring their students have a range of meaningful opportunities to investigate and discover through active learning," says CRS Teacher Services Manager Corinn Brown. "We share their strategies and tips, aiming to encourage more (continued on Page 2)

## Science Super Star Educators Transform Teaching (continued)

(from page 1) teachers to find ways to bring science to life for their students.” CRS celebrated with this year’s honorees at a special luncheon in March. In the words of one honoree, “As a result of the Science Super Star Challenge, my students are not just learning science facts in isolation, but they are trying to solve real-world issues.”

Along with recognition, the program provides a range of prizes for teachers and students including science-themed books, classroom supplies, field trips, and schoolwide assemblies and science festivals. Partner organizations such as Cal Academy and East Bay Regional Parks, and employees from companies such as Caribou and Health Advances bring exciting science learning activities to the teacher honorees and their students.

Thank you to our partners who donate funds, books, assemblies, and field trips to our Science Super Star program. A list can be found at [www.crscience.org/educators/SSS2018](http://www.crscience.org/educators/SSS2018). To see the valuable tips, strategies, and insight they shared to inspire fellow teachers to embrace science in their classrooms: [www.crscience.org/educators/SSS2018Quotes](http://www.crscience.org/educators/SSS2018Quotes). Here’s a list of the 2018 Science Super Star Honorees:

### **Berkeley Unified**

**Berkeley Arts Magnet**  
Carrie Peters  
Suzanne Wright

### **Cragmont Elementary**

Cherene Fillingim-Selk  
Eleanor Tiglao  
Meridith Aki  
Pamela Diebel  
Bobbye Smith  
Michelle Johnson  
Mollie Bluestein  
Nicholas Williams  
Kellie McElhaney

### **Jefferson Elementary**

Bethany Lourie

### **John Muir Elementary**

Carrie Johnston  
Heather Olson-Garcia

### **Malcolm X Elementary**

Debra Hill

### **Washington Elementary**

Mindy Geminder

### **Castro Valley Unified**

**Palomares Elementary**  
Meredith Evans

### **Fremont Unified**

**Brookvale Elementary**  
Connie Bi

### **West Contra Costa Unified**

**Ellerhorst Elementary**  
Denise Abersold

### **Tara Hills Elementary**

Shabana Johnson

### **Oakland Unified**

#### **Allendale Elementary**

Meaghan Matsuoka  
Alma Buena Vista  
Sara Salvaggio  
Mika Zelic

#### **Bridges Academy at Melrose**

Ann Park  
Gloria Garcia  
Aiko Keen

#### **Chabot Elementary**

Juli Ward  
Laura Shield  
Miranda Romo  
Leslie Rychel  
Darlene Perdisatt  
Deborah Flanagan  
Rebecca Dunning  
Kelleth Chin  
Danielle Todaro

#### **Cleveland Elementary**

Janet Lau

#### **Encompass Academy**

Liz Cruger  
Trina Jones

#### **International Community School**

Michaela Morse  
Lindsay Daseler  
Alejandro Estrada

### **Laurel Elementary**

Lena Why

### **Learning Without Limits**

Duffy Ross  
Eva Schlomann

### **Lincoln Elementary**

Maria Motonaga  
Robert Fong  
Brooke Guiney

### **Markham Elementary**

Elizabeth Cooke  
Nikita Gibbs  
Lynne Martin

### **Lafayette Campus of Martin**

#### **Luther King, Jr. Elementary**

De’Shawna Riley  
Tate Jawdat  
Rebekah Rylant  
Megan Tharp

### **Martin Luther King, Jr.**

#### **Elementary**

Arvella Hayden  
Pali Ouye  
Judy Washington  
Maketa Daniels  
Michelle Williams  
Marta Sato

### **New Highland Academy**

Tracy Dordell  
Emily Blossom  
Erika Guerrero  
Carrie Anderson  
Melissa Frost

### **Prescott Elementary**

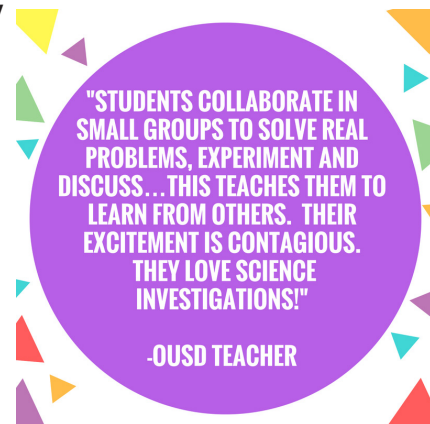
Constance Zunino  
Lorraine Mann  
Paula McGlone

### **Think College Now**

Sarah Golden

### **Thornhill Elementary**

Bonnie Forbes  
Ellyn Holman



## Inspiration, Exploration & Mentors: Ciencias en Espanol

What do lightbulbs, batteries, soda, seedlings, baseballs, lemon juice, solar panels, jellybeans, and test tubes all have in common? Answer: They – along with dozens of tubs full of supplies – make up the supplies needed for nearly 700 Berkeley 7th grade students to each successfully complete an independent science investigation.

In addition to lots of supplies, CRS provides over 140 well-prepared mentors (mainly graduate students and post-docs from UC Berkeley) to coach small groups of students in their science classes over the course of 6 weeks in a program called Be a Scientist. Now in its 4th year, the program serves every 7th grade science class in Berkeley. This year the program also included a contingent of mentors to provide Spanish-language coaching for Longfellow’s two 7th grade Spanish immersion classes.

Teacher Erik Garcia was amazed by the success and engagement of his bilingual students. “Can we please extend this to 6th grade too?” he eagerly asked program coordinator

Darlene Yan. The enthusiasm was contagious for the mentors too, with one grad student exclaiming “the best part of this program was watching the students get wide-eyed and excited about the results they were getting in their experiments!”



Longfellow students test out the new ball launcher as they launch a soccer ball filled with different compositions of air.

For their part, 7th graders said they enjoyed the opportunity to design their own experiments based on their interests, with the support of “nice, cool, helpful” mentors.

“I really felt like a scientist, because I got to design my own project,” said one student. Another added, “I enjoyed it because the scientists were there to support you and not to just do everything, but they helped you out whenever you needed help.”

Students had access to supplies and equipment they don’t ordinarily get to use in science class. Experiments included physics investigations using a soccer ball kicker, vacuum pump, cloud chamber, or a water

turbine. Sensory experiments tested color, taste, and smell perception under different conditions, and allowed students to discuss the ethics of human-subject research.

# Transporting Science With the Port of Oakland

Cranes that look like giant robot horses, a seashore that harbors diverse wildlife, and an airport that sends people and cargo all around the world: the Port of Oakland highlights 'real world' science and engineering in a dazzling array of ways.

To help Port of Oakland employees give elementary students a glimpse into aspects of Port operations, CRS teamed up with Port representatives to develop new classroom lessons and outreach demonstrations on topics like buoyancy, cargo handling, and transportation.



Port of Oakland employees are trained on a transportation engineering lesson.

"We love partnering with CRS," says Port Community Affairs Representative Luana España. "CRS makes it so easy. The lesson kits, the training, and the logistics support ensure our employees walk into classrooms confident and prepared."

One new lesson Port employees bring into local classrooms introduces first graders to engineering by challenging them to design a package that can safely

transport a golf ball and a fragile potato chip in the same container safely to their destination without breaking the chip.

Other activities CRS has developed for Port employees to share include an aluminum boat building challenge, learning about levers, and a simulated crane lift. Port teams have visited more than 100 young students in Oakland classrooms this year, and shared activities with hundreds more at events at Fairyland and the Oakland Athletics.

Whether it's a new team of graduate students in a Cal research lab, or employees of a local company, CRS helps scientists and engineers develop fun, engaging lessons that highlight the science they are most passionate about sharing.



Students build structures wearing Port of Oakland hard hats at the Oakland A's Science of Baseball Education Day.

# Spring for Science: Help Us Plant Seeds for More Learning



Student gets excited about magnets during a Day of Science with Bayer employees.

Wonder, inspiration and discovery are blossoming in local elementary classrooms because of seeds you helped us to plant throughout this school year!

Help us Spring for Science and reach the goal of \$25,000!

To make a donation, visit our giving website: [www.crscience.org/events/springgiving](http://www.crscience.org/events/springgiving)

Or mail a check and the form below to:  
Community Resources for Science  
1611 San Pablo Ave. Suite 10 B  
Berkeley, CA 94702

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1. Go to [www.smile.amazon.com](http://www.smile.amazon.com)
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3. Choose CRS as your beneficiary (you only need to do this once)
4. CRS will receive a portion of your Amazon purchases with no added cost to you, every time you shop.



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City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

Phone: \_\_\_\_\_ Email: \_\_\_\_\_

I/We would like to be acknowledged as follows: \_\_\_\_\_

To honor a specific teacher, please tell us his/her name: \_\_\_\_\_

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*Thank you to our partners at the UC Botanical Garden for co-hosting our volunteer appreciation celebration in May. Docent-led tours of the amazing flora were a highlight of the event!*

### In-Kind Sponsors

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La Mediterranee  
Lagunitas Brewing Company  
Lawrence Hall of Science  
Mystery Science  
Oakland Athletics  
Tacubaya  
The Tech Museum of Innovation  
UC Botanical Garden

### Science Super Star Book Donations

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Bellwether Media  
Candlewick Press  
Capstone Press  
Charlesbridge Publishing  
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Holiday House Publishing  
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Lisa Gamboa  
Macmillan Children's Publishing Group  
National Geographic Learning  
Nomad Communications/Nomad Press  
Random House Children's Books  
Sneed B. Collard

## Building Elementary Science Teaching (BEST)



This summer, CRS is partnering with UC Natural History Museums and Berkeley Science Project, Lawrence Hall of Science to welcome nearly 40 Richmond teachers for a week of elementary life science explorations alongside UC graduate student researchers.

Summer provides a brief break from classroom duties, allowing teachers the chance to explore, learn, and discover their own inner scientist! Throughout the Spring, CRS has been sharing out information about the many wonderful summer professional development opportunities hosted by dozens of Bay Area (and beyond!) partner organizations, museums, science centers, research labs, and more.



## Building Science Identity: What's Your Story?

If you are reading this, chances are you have a positive association with some aspect of science or engineering. How you came to form your identity as someone curious, capable, and interested in science is a unique and interesting story. And, most likely, early learning experiences played a key role in shaping your science identity.

This Spring CRS has been tapping into the experiences and insights of some of our volunteers, Science Super Star teachers, and Advisory Council members about their own pathways into science-minded identities. We're hoping these stories will help us to develop additional strategies to engage more teachers in finding their own "inner scientist" and foster their curiosity, comfort, and connections with science.

From our conversations about transformative experiences that nurtured science identities, several key themes emerged:

- Experiences that authentically demonstrated connections between science and personal interest, through activities as diverse as gardening, cooking, sports, social activism, camping, or race cars
- Exposure to role models, mentors, positive media representation; exposure to the wide variation of science fields
- Opportunities to have discovery experiences and "a-ha" moments



An excited student asked a scientist for her autograph after a lesson.

• Seeing "real world" applications of science in daily life  
 Another surprising theme that also emerged was the need to counter a fear of failure, and to address negative stereotypes and discouraging experiences that might have planted seeds of doubt.

Over the coming year, CRS will be exploring new ways to engage our teacher members in experiences that can build and nurture their own science identities. We'll try strategies to connect to personal interests such as gardening, sports, cooking, maybe even roller coasters. We'll look for ways to encourage our most-engaged teachers to bring along a colleague, and we'll strive to create authentic opportunities for investigation and discovery. We're interested in creating strategies to overcome fear of failure, and embracing failure as a critical part of science. After all, some of history's most important discoveries came about by accident, because the experiment didn't work as planned!

We've been delighted to discover how rich and deep our conversations about forming science identities have been. We encourage you to have a conversation with a colleague, friend, or family member: What

is the story of how you formed your science identity? How did mentors, educators, or experiences impact that journey? What obstacles did you have to overcome, if any?

## Making Connections at Chabot Space and Science Center

Building connections among a constellation of people, institutions and organizations is at the heart of the CRS mission to empower teachers to ensure young learners have opportunities to investigate, explore, and discover.

Once a year the stars align -- with a major assist from Chabot Space and Science Center -- allowing us to bring together dozens of these amazing science education providers such as museums, nature centers, and other science education organizations under one roof for our annual Science Education Resource Fair.

This year's event was held in March, part of our Field Trip for Teachers series. We welcomed teachers from around the Bay Area to explore the museum and to meet with representatives



A teacher learns about science resources for her classroom at the science resource fair at Chabot Space and Science Center.

from science education organizations ranging from major science centers, regional parks, and programs that explore science and engineering through art, gardening, technology, and environmental lenses.

Thank you to our gracious host Chabot, and all the participating organizations (see list below) for sharing with teachers and with one another about their offerings and what exciting things they have to look forward to in the coming year.

During a special theater program, teachers learned about Chabot's resources, enjoyed fun demonstrations and discussions, and particularly loved winning raffle prizes donated by our participating organizations. This year's program also included a panel discussion from BASIS volunteers, sharing with teachers about their own pathways into science and impact of early education experiences in building their own curiosity, confidence, and interest.

Bay Area Discovery Museum	Marina Education Programs - City of Berkeley
Bay Area Wilderness Training	Marine Science Institute
Chabot Space and Science Center	NatureBridge
EarthTeam	Point Bonita YMCA
East Bay Regional Parks Exploratorium	RAFT - Resource Area for Teachers
Forestry Institute for Teachers	Rotary Nature Center
Junior Center of Art and Science	SaveNature.org
Kids for the Bay	The Crucible
Lawrence Hall of Science	The Tech Museum of Innovation
	UC Botanical Gardens
	WestEd
	Wylie Charters



# COMMUNITY RESOURCES FOR SCIENCE

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## BASIS Team Spotlight: Bolt Threads, Inspired by Spiders



Welcome to our newest private industry team: Bolt Threads! This Emeryville company uses the structure of spider silk as an inspiration to engineer more sustainable fabrics. Fittingly, they teach a 2nd grade engineering lesson called “Materials & Structures” to introduce students to the engineering design process.

“This lesson intersects perfectly with what Bolt Threads engineers do every day-- understanding how the structure of a material may affect its properties,” explains CRS Senior Volunteer Manager Traci Grzymala. “It’s a great example of how BASIS volunteers bring ‘real world’ connections into classrooms, inspiring children to discover the science connections to the things they are interested in. A student who likes fashion might discover their own pathway into science after learning about the fabrics Bolt engineers are inventing.”

## CRS Team

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Tyler Chuck, *Communications Manager*  
Corinn Brown, *Teacher Services Manager*  
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**BASIS BY THE NUMBERS**  
CURRENT VOLUNTEERS: 600+  
CLASSROOM VISITS: 600+  
STUDENTS INSPIRED: 16,000+  
"I AM ALWAYS AMAZED HOW THE BASIS VISITS ENERGIZE MY CLASS!"