



COMMUNITY RESOURCES FOR SCIENCE NEWS

Weaving connections among teachers, students & science in the Bay Area

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Richmond Teachers Gather for Inspiration, Information & Practical Ideas

Squeezing, sniffing, slicing, and sampling lemons, teachers from several Richmond elementary schools gathered in September for the launch of a new CRS collaboration to Build Elementary Science Teaching (BEST). As the teachers pondered and debated the essence of lemons, or shook mystery boxes for clues to the contents, they had opportunities to learn and wonder together during a workshop aimed to help teachers deepen their science teaching practice.

Teachers from Richmond schools, including Grant, Wilson, Verde, and Ford, will have more opportunities through the CRS BEST program over the coming school year and summer to explore science phenomena, plan lessons, and even conduct field research alongside scientists. As part of the launch, teachers reflected on their current practice and established goals for the year. Top goals included increasing their use of hands-on, inquiry lessons, and giving students more opportunities to learn about science "in the real world" in order to build understanding and to be inspired about their own possible futures in science fields.



Teachers discuss how to use the "Mystery Box" activities in their classrooms

In partnership with the Lawrence Hall of Science, Bay Area Science Project and UC Berkeley Natural History Museums, CRS embarked on the BEST collaboration with the support of the West Contra Costa Unified School District. Our aim is that participating teachers, who report they currently teach little hands-on science, will become enthusiastic, empowered, and confident leading their students in science investigations and engineering challenges.

Following the first workshop, participating teachers indicated they got inspiration, ideas for hands on lessons, practical ideas/lessons to take to class, an introduction to Next Generation Science Standards,

and confirmation that language arts are strengthened through science. BASIS teams have been presenting lessons on soil diversity, magnets, renewable energy and much more, bringing enthusiastic scientists as STEM role models into these teachers' classrooms.

See photos from the Richmond BEST Collaboration on our Flickr page: www.flickr.com/photos/crscience/albums

CRS Science Outreach Grows in the East Bay

With over 150 attendees, our BASIS Fall Kickoff was a huge success! We're excited to get these teams trained and into the classroom to inspire the next generation of scientists!

2017-18 BASIS BY THE NUMBERS

CURRENT VOLUNTEERS: 600+
CLASSROOM VISIT GOAL: 500+
STUDENTS INSPIRED GOAL: 15,000



All smiles from a new BASIS team at our Fall Kickoff. In the words of a BASIS volunteer, "Children are always full of surprises and new ideas!"

Sign up to be a BASIS volunteer!
Email teach@crscience.org

Where to Find Collections of Fossils, Plants, Animals & Insects!

Normally closed to the public, the UC Paleontology Museum, the Jepson and University Hebaria, the Museum of Vertebrate Zoology, and the Essig Museum of Entomology opened their doors to CRS and our teacher members for our fall 2017 Field Trip for Teachers.

Scientists from each of the museums led small groups of teachers on guided tours, sharing examples and engaging explanations about the value of these vast collections to academic discovery. Specimens provide a physical “snapshot” of a species over the years, recording how the species evolved, what pollutants were prevalent at the time of collection, and so much more.

And teachers discovered that the drawers and cabinets and cases brimming with collections are still providing new insights. The scientist guides explained how new species are still being identified that have been in collections for years but had been misidentified because of similarities to known species.

For teachers inspired by the collections and how they are used to foster scientific understanding, the UC Natural History Museums and



Teachers enjoy a tour of the the Museum of Vertebrate Zoology given by one of our BASIS Volunteers

Our next Field Trip for Teachers is Saturday, March 17 for our 4th annual Science Education Resources Fair, featuring 20+ local organizations at the Chabot Space and Science Center.



Teachers took a tour of the Museum of Paleontology including a tyrannosaurus rex sksleton in the Valley Life Sciences Building atrium

CRS have put together some resources about how teachers can create and use specimen collections in their classrooms. Teachers can also learn about how to use the UC Berkeley campus as a resource for science field trips guided by experts or on your own. We have put all these resources on our website at www.crscience.org/educators/FTFTfall2017.

If you are interested in touring these four natural history museums, mark Cal Day 2018 (April 21, 2018) on your calendar as it is one of the few times that they open their doors for tours. calday.berkeley.edu/

Thank you to our generous UC Natural History Museums hosts for offering our CRS member teachers this rare treat of a behind-the-scenes glimpse into how present day researchers are still building understanding of our world through collections of plants, animals, insects, and fossils that have been collected over many decades.

See photos from our event on our Flickr page: www.flickr.com/photos/crscience/albums

Be A Scientist 7th Grade Mentoring Program: By The Numbers



A Be A Scientist mentor helps a student develop his own science experiment studying the strength of magnetic fields

Now in its 4th year, the Be A Scientist program will reach:

**3 Berkeley Middle Schools
(King, Willard, & Longfellow)
25 Science Clasrooms
650 7th grade Students with
125 Scientist Mentors**

Sign up to be a Be A Scientist mentor this Spring!
Email BASprogram@crscience.org

Thank You to Our Corporate, Foundation & Business Partners

These foundations and businesses are supporting our work in 2017, making it possible for CRS to provide teachers, schools and districts with free support and in-class scientist presentations. Thank you to these partners!

Grants and Sponsorships:

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 The Last Bottle
 The Tech Museum of Innovation



Students discover the minerals in our food by dissolving cereal and using magnets during a Day of Science with Clorox Employees

Volunteers Build Skills in Teaching & Communicating Science

Every year we train hundreds of new volunteers to communicate their science and engineering research and share their stories with a broader audience.

Since August of this year, we have already welcomed over 150 new volunteers into our BASIS program. These volunteers have each been coached in developing an engaging “elevator pitch,” a quick 2-3 minute talk to introduce themselves to elementary school students at the start of classroom BASIS visits. In addition to describing the volunteer’s research field, the brief introduction cites the inspirations that led to their career in science or engineering. Most importantly, these introductions emphasize the real world connections of scientific research in the everyday lives of young students.

Creating an engaging elevator pitch is no easy task! But our BASIS volunteers are dedicated to becoming effective science communicators and our BASIS program managers provide the guidance and training to ensure their success. In addition to coaching new volunteers in basic communication of science and classroom management, CRS staff also presents workshops throughout the year to further develop the skills of both new and seasoned BASIS volunteers.

In our workshop on **Classroom Management Techniques**, we discuss effective strategies for engaging students with hands-on science and engineering lessons while

maintaining student attention throughout these lessons. This workshop provides our volunteers with the tools and confidence they need when they enter any elementary classroom so that they lead successful lessons.



Our BASIS Steering Committee members come from the Chemistry, Chemical & Biomolecular Engineering, Electrical Engineering & Computer Science, Earth & Planetary Science, Astronomy, Materials Science, Physics, Molecular & Cell Biology, Integrative Biology, Neuroscience, Plant & Microbial Biology and Bioengineering departments.

Through our feedback surveys from last year, our volunteers reported that they would like more training in the best ways to include students who are **English Language Learners (ELL)** in their BASIS lessons. In response, we have developed a workshop on Engaging English Language Learners, which covers an overview of ELL, a discussion of strategies currently used for language immersion in California schools, and the most effective strategies that encourage ELL students to participate in BASIS lessons.

Additionally, we offer a workshop that focuses on **Understanding the Nature of K-5 Students**. This workshop covers Kindergarten through 5th grade students, exploring what students are learning at each grade in science, reading, and math to provide a broader context to our BASIS volunteers so that they can teach more effectively. This workshop also covers the learning environments and emotional and cognitive development of students at different ages, helping our volunteers to understand which teaching strategies will be most effective for the grades they lead in science and engineering lessons.

How Do You Measure Inspiration?

For those of us working to provide elementary and middle school teachers with practical support, the challenge of how to measure the impact of our work can be daunting. We know in our hearts that the connections we foster, whether between teachers and a science center or between visiting scientists and a roomful of 2nd graders, will have lasting impact that amplifies well beyond the actual interactions. As a result of a CRS workshop or event, a teacher may hone skills that will benefit not only her current classroom but future students as well. The BASIS volunteers who lead a lesson on phase changes, with spectacular dry ice demonstrations, spark flickers of interest, self-identity, curiosity, and inspiration that may kindle for years before impacting a student's decision to apply for a STEM internship or take a high school science course.

To measure impact, some organizations seek large grants to pay for substantial research and evaluation, while others point to changing test scores, graduation rates, or other readily available metrics. What other methods are available for highlighting the impact that our work empowering teachers and inspiring students is having?

The CRS Advisory Council tackled this question at the Fall convening, and developed a robust list of assessment tools, resources, and strategies to assist us in measuring impact and telling a compelling story about the effectiveness of our programs and services.

While finding the right numbers and tracking the right data remain challenging, the Advisory Council members shared an amazing array of existing resources that will help further our efforts to track collective impact.



Students learn about glaciers with models during a BASIS lesson

But, the Advisory Council members all agreed that stories from individual participants – teachers, students, scientists – provide a critical dimension. Videos, infographics, profiles, and “a day in the life of” type features all illuminate the many ways our science education work has both immediate and lasting impact.

For CRS, the comments we receive from teachers each year together form a powerful mosaic of the ways elementary science teaching and learning is transforming and growing stronger over time. While it may not tie in directly to graduation rates, we are confident that providing our youngest learners with exciting opportunities to explore, follow their curiosity, think about data that they collect themselves, and put together explanations for how their world works is providing a critical foundation for skills, self-identity, and interests that will carry with them through their K-12 years and beyond.

Inspiration comes in many shapes and sizes, and it's not always easy to measure. We take heart in feedback like this from one of our 2017 Science Super Star honorees to confirm that our work is on track and having lasting impact on both teachers and students:

“Through the Science Super Star Challenge, every year my students get even more excited about science! The various resources, books, and prizes that CRS provides have not only helped me and my students feel recognized for being scientists but also motivates us to continue to do more science in the classroom. It’s always a great program that makes my students feel happy and proud to be young scientists!” –1st Grade Teacher, Oakland Unified School District

Sharing the Joy of Science at the Bay Area Science Festival

This fall, as part of the Bay Area Science Festival, CRS brought hands-on science explorations for families beyond the classroom walls and into some unexpected places, including local farmers' markets and AT&T Park.

Children visiting local farmer's markets explored activities about plant parts, microorganisms and buoyancy at the CRS pop-up science table, in collaboration with partners Science @ Cal and UC Berkeley CLEAR. Students delighted in the special Halloween-themed farmers' market, with CRS presenters dressed up with science themed outfits to help inspire the next generation of scientists.



“Volunteering is empowering because it allows me to share the magic of science with young, growing minds,” says one participating CRS volunteer of the outreach activities

At Discovery Day at AT&T Park, CRS presented a “Pulley Power” activity in which students explored the physics behind fixed pulleys, movable pulleys, and pulley systems. Tens of thousands of people turned out for the day-long celebration of science and engineering.

Organized by the Science & Health Education Partnership (SEP) at UCSF, the 7th annual Bay Area Science Festival spanned over two weeks from October 26-November 11th. Some of this year's amazing array of events included Science @ Cal's Vision+Light exhibits, Science Friday Trivia Night, UC Berkeley Lab Tours, and much more!



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Students extract DNA from strawberries during a Day of Science



Students fascinated by models during a BASIS lesson on adaptations

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"My students were ecstatic and it is a great opportunity to see scientists as approachable role models. The visitors were excellent and it was a great medium for science instruction."

-OUSD 4th Grade Teacher



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