

# CRS: Empowering Scientists & Engineers to Engage in K-12 Outreach



**CRS**

**COMMUNITY RESOURCES FOR SCIENCE**  
*practical support for great science teaching*

Teresa Barnett, Executive Director  
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[www.crscience.org](http://www.crscience.org)



# Community Resources for Science (CRS)

[www.crscience.org](http://www.crscience.org)

## “For Volunteers” tab

- Planning tools
- Lesson plans
- Volunteer resources
- Standards info
- Spotlights

The screenshot shows the CRS website homepage. At the top, there is a search bar and social media links. The main navigation bar includes tabs for Home, About CRS, Programs & Services, For Educators, For Volunteers, For Science Providers, and Get Involved! Below the navigation, there are several content sections:

- Teacher Services** (red tab)
- BASIS Volunteer Program** (blue tab)
- CRS Supporters** (yellow tab)
- Local Science Organizations** (green tab)

A central image shows a woman in a blue shirt interacting with two young boys at a table with plants. A quote box next to it reads: "I see that through CRS, students understand the connection between learning in the classroom and the outside world. CRS sends the message to students and the school community that science instruction is important; we see time and money invested in this effort to bring science instruction to life." - Principal, Oakland

Below the main content, there are three featured sections:

- What's Happening ...**: "Relating Science to the Rest of the World" featuring Graduate student, Megan Vieira, who has been volunteering with BASIS for over two years, building on her previous teaching experience as an Interpretive Park Ranger and substitute teacher. [Read more](#)
- Spotlight On ...**: "CRS Teacher Voices" featuring a video titled "CRS Teacher Voices" with a duration of 0:00 / 2:30. [Read more](#)
- Science Super Star Challenge!**: "Are you ready to take the Science Super Star Challenge?" featuring a video titled "CRS Science Super Stars" with a duration of 0:00 / 2:09. [See last year's winners & their reactions here!](#)





# Community Resources for Science

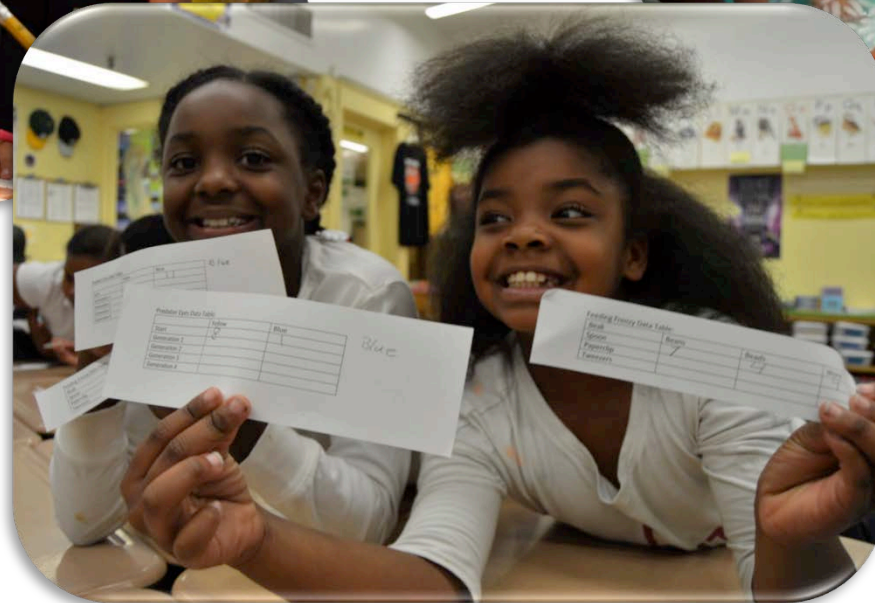
Providing nearly 1,800 K-8 Teachers Direct Support since 1997





# Community Resources for Science

Inspiring Students to Image Their Own Future in STEM through Role Model & Mentor interactions







# Bay Area Scientists in Schools (BASIS)

## Provide Diverse Science Role Models

- 1-hour in-class lessons aligned with standards
- Dispel stereotypes
- Equity focus

## Inform and Inspire Students

- Share hands-on STEM experiences
- Supplement limited hands-on science teaching in many areas

## Support and Motivate Teachers

- Model authentic inquiry
- Demonstrate students' engagement
- Create a ripple effect



- 700 scientists & engineers from UCB and industry
- 500+ K-6 in class visits
- 15,000+ students

# Bay Area Scientists in Schools (BASIS)

- 700+ scientists & engineers from UCB
- Training, coaching, logistical support
- 550+ K-6 in class visits
- 16,000+ students



Comparative Market value:  
550 lessons @ \$150 each =  
\$82,000

# BE A SCIENTIST

*Help middle schoolers discover their inner scientist!*

Mentor 7th grade students as they design, carry out, & report on their own independent scientific investigations!



*"I really enjoyed conducting experiments and collecting data. It was great to have such an experienced scientist helping me!"*

**-7th Grade Student**

Volunteers make a commitment to visit the classroom for one 90-minute class per week for a total of six visits.



# Be a Scientist, 7<sup>th</sup> grade mentoring

- 180 scientists & engineers from UCB
- Training, coaching, logistical support
- 700+ Berkeley 7<sup>th</sup> graders
- Allows differentiation
- Engage in authentic science and engineering practices





# UC Participation Stats

## **Total UC Berkeley Active Participants 2018-19: 889**

*An additional 200+ are “floating” status, participating on-call, one time events*

*55 Departments, Student Organizations; 350+ lab group affiliations*

- Grad Students    630        71%
- Postdocs            57
- Undergrads        190
- PI, Other            12

Demographics (greater diversity than STEM fields or degree programs)

- 55% are women, 43% male, 1% transgender, 2% other
- 63% identify as a person of color

# Participation by College

College of Chemistry	188
College of Engineering	178
College of Natural Resources	110
L&S MPS	107
L & S Biological Sciences	214
School of Public Health	25
L & S “other”	17
C. Of Environmental Design	2
School of Optometry	18
Other	30
Total:	889 participants





# Impact on teachers

## 1,800 K-8 teachers in Oakland, Emeryville, Berkeley, Richmond, WCC

- Personalized long-term support to meet individual needs
- Strengthen science teaching skills, increase confidence
- Increase motivation = more time, higher quality science learning for children
- Engage in practices of science and engineering
- Discover the power of inquiry, hands-on learning to engage all types of learners



*Being able to observe my students engaging with content, having scientific conversations, and interacting with the volunteers was truly incredibly helpful for my teaching practice.  
Thank you SO much!!                      3<sup>rd</sup> Gr. teacher*

*Science is so critical to the future of our students and our society, yet schools rarely give it the attention reading, writing, and math get. It is essential that those outside the school system continue to offer their expertise, support, and advocacy for science instruction. —WCCUSD teacher*

*I wanted to personally thank you for the care you put into the lessons! I appreciate how patient you all were with the kids and how much you connected. Science is a subject where all of my students are able to thrive and feel safe and it was great to have you all a part of it. My class LOVES guest teachers.*

*3<sup>rd</sup> Grade Teacher, OUSD*

*One of my favorite things is having my learners see women and people of color in science!! They reflect my classroom and that makes me happy & positive for our future! - Berkeley 5<sup>th</sup> grade teacher*

*One of my students - who often struggles greatly - really surprised me with a creative solution to a problem. His solution surprised everyone and raised a lot of new questions for the group - why did that work? Can we do it too? I could see it built my student's confidence and he has been doing better at staying on-task and focused in science class. - OUSD 4<sup>th</sup> grade teacher*





# Impact on K-8 students

**43,000 in Oakland, Emeryville, Berkeley, Richmond, WCC**

- BASIS teams directly engage 16,000 students each year
- Be a Scientist mentors support 700 7<sup>th</sup> graders each year
- Cal scientists facilitate professional development for 100+ teachers each year
- Engage with thousands of people at school STEM events, festivals, Cal Day and more
  
- Kids meet inspiring role models
- Discover skills, interests, career pathways
- Dispel myths of “who” can be a scientist



*Students say:*

*We became strong in our learning!*

*Science is cool!*

*This was a WONDERFUL experience for my students to talk to real scientists and they were beyond thrilled! I am always amazed at how the BASIS visits energize my class. My students are made to feel safe to explore and learn because the scientists make them feel so comfortable and confident.*

*I was specifically impressed with the answer a volunteer gave to a student question. The student asked when the volunteers became scientists. The volunteer flipped the question and asked students when they started asking questions and searching for answers -- explaining we are all scientists. It was a truly beautiful moment.*

*Girls get to see real women who are working in the field of science. I know my young girls really appreciate seeing women who like science the way they like science.*





# Impact on Cal Scientists and Engineers



- Strengthen skills in communicating science concepts and information, share their research and why it matters
- Engage learners in active inquiry & critical thinking, strengthen teaching skills
- Social & emotional: Lab cohesion, coordination, collaboration, build community (and fun!)
- Share their pathways & serve as role models and mentors – sense of contributing to the community and impacting lives
- **Demonstrating skill in broader impacts for grants, ‘beyond the bench’ practical professional skills for future employment**

***BASIS lets me be the scientist-role-model of color I didn't know existed until I was in high school.***

*BASIS is the perfect opportunity for me to engage children in the sciences by showing them science is fun! As a female, I hope to serve as a role model to young girls to show them that they too can be a scientist!*

***As a mentor, I get to see kids experience the joy of discovery, which reminds me that I love what I do. I am so lucky to be a scientist.***

*Children have such creative answers and approaches to a problems, it gives me hope for the future and shows how important it is to get them thinking about active problem-solving at a young age. I try to bring some of their lateral thinking back to the lab with me, too!*

***Often times while performing scientific research it is easy to feel frustrated, stupid, and to suffer from imposter syndrome. Not only does BASIS remind me how far I've come as a scientist, it allows me to give back to the community and instill the confidence in students and positive association with science that helped me get to where I am.***

*I love teaching science to children, and CRS makes doing this almost effortless. The time BASIS staff puts in behind the scenes enables busy graduate students to get into elementary school classrooms and work with children efficiently and effectively.*

*Volunteering with BASIS obviously helps the students foremost, but I always feel so energized after volunteering in the morning, and my work with basis has actually helped my academic career. I recently won a NSF graduate research fellowship and the reviewers specifically commented that my monthly volunteering at local schools through basis showed "substantial effort." Wow!*

*As someone interested in becoming a professor, it is really important to me to work on becoming an effective teacher. Volunteering with CRS has helped me think about how science is taught and how it can be made optimally accessible for different age groups.*



# Impact on UC Berkeley



- **Grants – demonstrating broader impact, support early career, fellowships**
- **Develop skills of scientists and engineers in sharing their research and communicating about the nature of science and engineering, importance**
- **Builds community among campus cohorts (within labs, departments, across affinity groups); especially important for URM, women**
- **Connect campus with the broader community – visible, efficient, collaborative**
- **Serves on Steering Committee, Coalition for Education & Outreach (CEO) and Science & Cal: campus based organizations for sharing Cal science**
- **Contribute to scientific literacy, interest, value of science and engineering**

*CRS has been a valued partner in bringing UC scientists into local classrooms for many years... Their careful training and coaching prepares UC scientists to communicate clearly about scientific knowledge and concepts with a young audience, while also providing training in basic classroom management and effective teaching strategies...I enthusiastically support the work of CRS to increase the visibility and impact of Cal sciences in the local community. We look forward to working together to provide more opportunities for K-8 students to discover the joys of science by engaging in active science learning with members of the Cal community.*

Rachel Winheld, Director, Science@Cal

*CRS STEM education outreach, including BASIS and Be a Scientist (BAS), benefits UC scientists, elementary students and teachers, and society at large. CRS programs provide a rewarding, accessible opportunity to share science with the community in a program that fits with the busy schedules of graduate students. It allows Berkeley scientists to tangibly engage with their desire to promote equality in science education opportunities...Graduate students and post-docs benefit greatly from the training and logistical support provided by CRS in order to be effective, successful science role models.*

Erin Creel, PhD Candidate, Chemistry



# CRS Support & Consulting for Broader Impacts



- Designing Effective Outreach Efforts to Meet Your Goals & Reach Target Audience
- Training for Graduate Students (Communicating science, leading inquiry, engaging educators)
- Nuts & Bolts: Checklists, tools, best practices
- Logistical support
- Connections to partners and resources
- Data collection & Measuring Impact