



*I love seeing that students from all over the Bay Area experience the joy of science because of CRS. Each year, my science instruction becomes stronger and I realize how much science was missing from my own elementary experience! Thank you!*

*--1<sup>st</sup> Grade Teacher, San Leandro*



## Community Resources for Science

Empowering educators & scientists to engage young learners in wonder, exploration & discovery

# 2023-24 Impact Report:

## Building Belonging through Joyful STEM Learning



*I love CRS! They are my go-to for anything science related. Because of CRS, I went from not wanting to teach science, to it becoming my favorite thing to teach! – Oakland 3<sup>rd</sup> Grade Teacher*

## Overview

The following feedback we received from an Oakland principal encapsulates the transformation that Community Resources for Science programs and services are designed to bring about:

*Many thanks to you all for your outstanding contributions, support and guidance to ensure we had a successful first ever STEM Day! Students were super excited and joyful to engage in rich, hands-on science experiences to promote deeper learning including problem solving, critical thinking, collaborating, discovery, exploration and innovation! This collective effort helped to increase access and equity. Many, many thanks for your support and for that of your volunteers to make this day truly a SUCCESS!*

Since 1997, CRS has provided long term partnership with the teachers and schools we serve, offering a range of opportunities to meet their changing needs. We help make connections with scientists, museums, and other partners who bring active learning experiences to life for children.

This brief report presents a snapshot of the quantitative and qualitative impact of CRS programs and services for East Bay science educators and TK-8 students during the 2023-24 school year.

### Program Metrics: Impact By the Numbers

CRS served **1,700 teachers**, in **140+ schools** across 10 East Bay school districts, impacting learning for more than **45,000 TK-8th grade children**

**More than 1,000 well prepared scientists and engineers** directly engaged **16,000 young learners**, leading **590+** in class lessons and dozens of festival and special event presentations

More than **650 7<sup>th</sup> grade students** had individual mentoring support from **135 UC Berkeley science and engineering grad student mentors**

More than **2,500 children – and 34 teachers – earned Champions of Discovery** recognition, receiving thousands of science kits, books, and other prizes.

**400+ teachers** took part in professional learning and collaboration.

*Having kids meet real scientists and seeing that they look very much like every day people helped my students imagine themselves as scientists more! We have been reading about scientists and engineers who discovered or created things out of need, such as the inventors of crayons or portable air conditioner. It has inspired my students to imagine how they could create something to solve problems.*

*--2<sup>rd</sup> grade teacher, Oakland*



*CRS has sparked my students' interest in fields of science they weren't even aware of. It broadens their knowledge and understanding of the world and how they can study it!*

*--3<sup>rd</sup> grade teacher, Richmond*



## Empowering Teachers: Real-World Connections, Support & Training

*The summer professional development absolutely made a difference in my teaching! Starting the year off with these lessons created an association between excitement and math and science time. Our students love wearing their scientist and mathematician hats, and most of the time both! The lessons from the workshop provided an awesome foundation for our year-long joy and love for math and science thinking and practices.*

– Kindergarten Teacher, West Contra Costa

CRS teacher members demonstrated their dedication to improving their science teaching by participating in professional development workshops, inviting scientist visitors into their classrooms, and documenting ways they led their students in meaningful explorations of science phenomena connected to their daily lives. Our Joyful Math and Science professional development initiative prepares teachers to become peer-coaches to fellow same-grade teachers, fostering student belonging and equity while building math and science skills.



State Superintendent Tony Thurmond even came to observe one of the summer workshops and to congratulate the teachers on preparing their students not only in STEM but in developing a love for learning!

Professional development collaborations this year included:

- Integration of Math and Science in Joyful Explorations
- Equity in STEM Teaching: Practices, Tools and Lenses for Designing Inclusive Instruction
- Climate Change & Environmental Justice, field testing new curriculum








*(above) Teachers and High School youth explore strategies for building climate literacy*

- Sketching and close observation: Taking Science Outdoors
- Summer Climate Institute: Building Climate Literacy
- Year-long Climate Literacy & Action Cohorts in Oakland, Berkeley
- District Climate Literacy Planning
- Becoming an effective Peer Coach: Leadership in Science Teaching



*PD for Oakland teachers to explore teaching science on their schoolyard.*

**The State of Science: As a result of CRS services and programs, teachers indicated . . .**

<p><b>98%</b> Discovered their students are more highly engaged &amp; motivated during science, making science a powerful engine for learning</p>	 <p><i>"I wonder like a scientist..."</i></p>	<p><i>It took my students a while to understand that science is all around us in our daily lives, but after we started talking about it, they got really excited! They kept naming items from their homes or our classroom and exclaiming 'That is science too!' Science engages all students no matter their academic level in other subjects.</i></p> <p><i>3<sup>rd</sup> grade teacher, Oakland</i></p>
<p><b>95%</b> Became more confident and enthusiastic about teaching science</p>	<p><i>I learned that my students love to learn when they are building things or when they are outside exploring. The CRS Champions of Discovery challenges have helped me to get out of my standard 'teaching practices' and really see my students shine!</i></p> <p><i>– West Contra Costa teacher</i></p>	
<p><b>95%</b> Added new science lesson, field trip, or other experience</p>		<p><i>My students visited our Miyawaki native forest to observe leaves and use those drawings to write letters to the city council to convince them planting micro forests is a wise way to spend city funds. They learned that they can use their scientific knowledge of why native forests are good for the planet to make real change.</i></p> <p><i>--Elementary specialist, Berkeley</i></p>
<p><b>86%</b> Effectively used Science to build Language arts or math skills</p>	<p><i>Bringing measurement in as part of our science observation and journal sketching has been a huge addition. It helps bring the element of scale that had been missing before, and supports finding patterns and non-standard measurement too.</i></p> <p><i>– 4<sup>th</sup> grade teacher</i></p>	
<p><b>83%</b> Teach science an hour or more per week</p>		<p><i>There is not enough focus in elementary education on math and science. I appreciate CRS resources, high quality PD, and partnering with me to make science a priority for my young learners in their first year of school. – Richmond K. teacher</i></p>



## Engaging Scientists: Fostering Belonging for Young Learners

**97% of teachers indicated having CRS scientist visitors strengthened their students' sense of identity or connection as a person who belongs in STEM. Nearly 100% said their students asked thoughtful questions and grew more interested in science.**

Scientists and engineers -- 750+ from UC Berkeley and 250+ from local STEM industry -- brought their expertise and countless bins of supplies including seeds, soil, batteries, balloons, and microscopes to:

- lead lessons in classrooms
- serve as experiment mentors & role models
- host STEM activities at science festivals
- lead teacher professional development
- engage families at school science events
- serve Science Ambassador residencies

Teachers value not only the content of the lessons, but also the diversity of the scientists (65% identify as a person of color, nearly 60% identify as women) who share about their own pathways into STEM fields and inspire children to imagine their own bright futures.



Scientists in the classroom also provide teachers a valuable opportunity to observe their students as learners. **95% of teachers indicated they were surprised by at least one student who was participating or demonstrating skills above their typical classroom level, showing teachers a new way to engage an otherwise struggling or disengaged student**



*My class loved the Storytime Scientist visit, and the chromatography experiment. They loved getting to bring their pipettes home to teach their family about color composition. Thank you so much for bringing science and joy to our classroom!*

- San Leandro 2nd grade teacher



## Representation Reflections: Teachers, Scientists & Young Learners

*We appreciated the thoughtful, supportive, engaging panel of scientists for our (elementary science specialists) meeting. We were all blown away by their passion for their work, their insight into their own journey and their patience as we struggle to become better educators. It was truly inspirational to hear how they have fought to find their place as a scientist, and we learned a lot about making science more accessible to the students of color in our diverse classrooms.*

– Berkeley elementary science specialist



Throughout the year, CRS provided customized support for teacher professional development. We customized PD for individual school sites, across entire districts. We worked with partners to bring together hundreds of teachers from around the Bay Area for summer institutes and special convenings. Scientists helped to plan and deliver many PD sessions.

### **Power of Building Cultural Connections: One Story**

*I appreciate the conscious representation of diverse scientists that CRS has visiting classrooms. It was so amazing to see my student who wears a hijab instantly connect with a scientist that visited our classroom because she also wore a hijab. I know that moment of connection will last forever, not just for that student but for my whole class.*

--2<sup>nd</sup> grade teacher, San Leandro

*I am Muslim and I wear hijab. In one of my first sessions, a young girl ran up to me so excited to meet me. She was about 7 years old and was eager to engage with the lesson and learn about astronomy, and I could tell it meant a lot to her to see someone with a similar cultural background come to her classroom. She later drew a picture of us together in her science journal. This was a very rewarding and touching experience for me!* --UC STEM volunteer



*My most memorable moments have been those where my background as a Mexican immigrant becomes relevant in my interactions with the students. In one primarily Spanish-speaking classroom, one of the students came up to me after I introduced myself and was very excited to tell me that his name was also Jose. In a different classroom, I chose to teach part of the lesson in Spanish since every single student in the room was Spanish speaking and several students did not speak English. When I was in elementary or middle school, I didn't have any exposure to STEM and I'm grateful that I'm able to share that with these young students. More importantly, I'm grateful that I have the opportunity to do so as a "familiar" face. --UC STEM volunteer*



# Joyful Science Learning Builds Essential Language and Math Skills

In addition to memorable, powerful, authentic learning experiences, research confirms that children who have joyful science and math learning build essential foundational scientific and climate literacy.

Program evaluation confirms our intentional, interconnected, multi-pronged approach is effective in building teacher capacity. Children immerse themselves in guided sense-making driven by their curiosity and nurtured by well-prepared scientists and educators.



*The Science Ambassador was so fun! The kids were amazed, it was like she was a rockstar. They asked her a million questions and she was patient enough to answer all the questions. I finally had a lightbulb moment: This is what's important, that the kids are able to have this dialog with a scientist! – Richmond teacher*



*Science is all around me! I think like a scientist when I bake with my mom, when I ride my bike, and when I look at the stars.*  
 –1<sup>st</sup> grade student



## Middle School Mentoring & Investigations Build Confidence & Engagement

Celebrating the 10<sup>th</sup> year of the “Be a Scientist” STEM Mentoring program in Berkeley Unified School District, the collaboration for the 2023-24 school year provided four 6-week sessions across all Berkeley middle schools. All together, 135 UC Berkeley mentors from across 20 STEM fields provided nearly 1,500 hours of individual in-class support across Berkeley middle schools for 659 students who designed and conducted their own self-selected scientific investigation.



Teachers noted the impact on students “blossoming into scientists in the making.” The mentors’ representation of diversity across gender, ethnicity, cultural backgrounds, and even fields of study, had a significant impact on students. They said they liked:

*...that my experiment was about two things I love, water and sound.*

*... how it was my choice what I did and how I did it.*

*.. that it was hands on and that I got real, reliable answers.*



### **Extending STEM Mentors in Richmond Middle Schools**

Middle school students in Richmond met mathematicians in their College Explorations classes, exploring possible answers to the perennial math class question of “When am I ever going to use this?” Calculating fastest routes to a baseball game during peak traffic, or navigating to the best rides in a crowded theme park, were some of the real life challenges students explored. Overall, more than a dozen STEM mentors brought science and engineering

experiences and career explorations to more than 300 Richmond middle school students.



### **8<sup>th</sup> Graders Flip the Script in Reverse Science Fair**

Dozens of UC and Lawrence Berkeley Lab scientists presented their research to small groups of 8<sup>th</sup> graders across the entire Berkeley district, as we expanded the innovative Reverse Science Fair. Students had a rubric for evaluating the scientist presentations, and listened intently to a series of scientist presenters. The 8<sup>th</sup> grade teachers were delighted to see their students putting their skills of close listening, careful questioning, and evaluating claims and evidence to good use.



## 2023-24 BASIS Lessons Featured Health, Energy, Fossils, Climate & More

Asking Questions, Like a Scientist!

About the Drought

All About Pollution

All About Vaccines

Artificial

Photosynthesis

BioEngineering:

Design A Pill

Coating

Biomining

Buoyancy:

Who Sank the Boat?

Can We See Your DNA?

Catapults

CheMystery Liquids

Clean Oceans For Powerful

Communities

Clouds, Clouds Everywhere

Colloids and How to Find Them

CSI: Chromatography Science

Day of Engineering

Day of Science Festival – Energy!

Engineering Festival

Fun with Physics Festival

Discover the Microscopic World

Environmental Ed: Garden Visits

Electricity, Magnetism and the Wall

Socket

Engineer Something For Outer

Space!

What Problem Can You

Solve?

Exploring Magnets

Exploring States of Matter:

Understanding Solids,

Liquids, and Gases

Eye See It: Understanding

How Eyes See

Eyes are SPEC-tacular

Germs and Your Body

Graham Quakers!



Green Polymers

Household Mold

It's Just A Phase!

Joyful Math and Microorganisms

Leaf Fossils & Climate Change

Energy & Climate Change

Light Up!

Lights! Colors! Vision!

Magnet Mania!

Meet scientists & explore STEM

careers

Microorganisms: Good or Evil?

Oceans Are For Everyone!

One Health One World!

Optimization & Minimization

Outbreak: Germs, Your Pet, and You!

Paper Clip Motor

Parts of the Brain

Pesky Pesticides

Pixels: Vision in the Digital Age

Playing with Lights!

Prehistoric Puzzle: Understanding the

formation of fossils

Renewable Energy & Climate Change

Reverse Science Fair

Robots that Run

Science Ambassadors

Simple Circuits

Snapshots in Time:

Exploring the Fossil Record

Storytime with a Scientist -

Rosie Revere, Engineer

Storytime with a Scientist -

Ada Twist, Scientist

Using and Storing Electricity

What Is In Outer Space?

Planets, Moons, Stars!

What Is Outer Space?

What's the Matter with Gas?

Wildfires

***CRS has changed my way of thinking when it comes to teaching science! Every year, I am implementing new concepts and more hands-on experiences for my students. – TK teacher***

***You can't even begin to imagine the impact that CRS has in my classroom here in East Oakland. Without their support, we wouldn't have all the extra resources and scientist visitors for our more than 600 students to explore science. – OUSD science specialist***