



CRS

COMMUNITY RESOURCES FOR SCIENCE
practical support for great science teaching

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2012-2013 School-Year Report & Program Evaluation: Accomplishments and Impact

Overview:

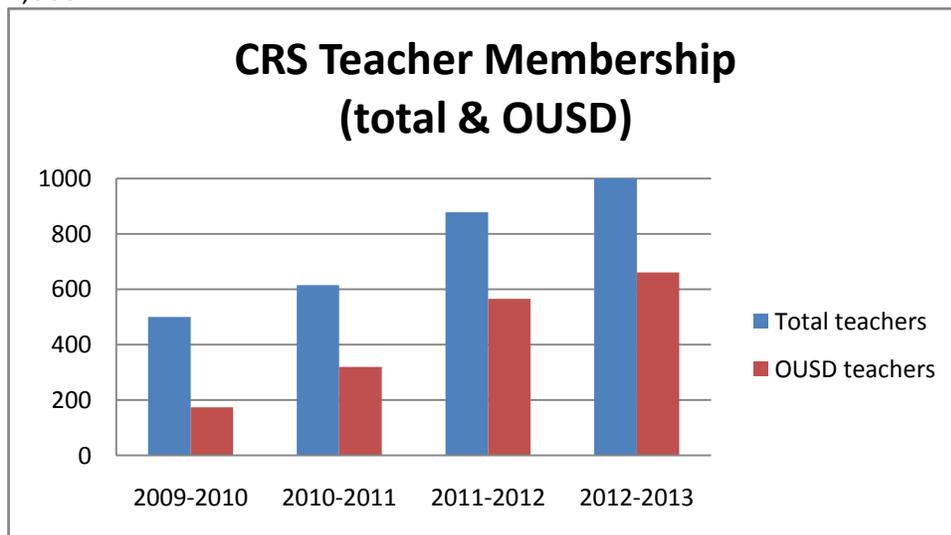
CRS works to nurture students' understanding of the world around them by connecting classroom teachers with scientists, museums, enrichment providers, and professional development programs in order to bring more science learning experiences to students. CRS also helps individuals and organizations involved in science education to work together and become stronger partners for teachers and schools.

Our goal is simple: help teachers give elementary and middle school students more opportunities to “do science” – to ask questions, test ideas, get their hands on real science activities.

Teachers and principals have expressed appreciation for the support they receive – and many have also expressed surprise at how much more science they are teaching now that they see how to connect science experiences across the curriculum. (Sample quotes included below)

Highlights for 2012-13

CRS continued to develop our partnerships with Oakland, Berkeley, Emeryville and other districts and schools during the 2012-13 school year. We continued on the growth trajectory of the previous several years, increasing the total number of teachers in our network to over 1,000.



CRS direct support for teachers included:

- **1,035 teachers (up from 878 last year) at 110 schools receiving CRS membership services.** Together, they educate over 22,000 students.
- Support for **all Lead Science Teachers in all Oakland elementary schools & all Science Resource Teachers in all Berkeley elementary schools.**
- **Special focus on OUSD Science and Literacy Cohort schools.** This included onsite presentations at staff meetings, additional personalized support, outreach for special opportunities, and collaboration with afterschool programs on some school sites to highlight ways to link afterschool to in-school learning
- CRS presented **456 in-class BASIS lessons** in local classrooms. *Because they generally work in teams, these classroom presentations resulted in **over 1,400 scientist & engineer role model interactions with students and teachers in classrooms.***
- This represents **2,700 hours of scientist role model volunteer** doing science with **more than 10,250 students** and their teachers.
- CRS prepared **318 customized science resource reports for individual teachers (up from 239 last year)**, providing personalized support for teachers' unique planning and teaching needs.

CRS provided the following services to all member teachers:

- **Monthly ScienceBlast Email newsletters** delivered directly to each teacher's email inbox, with easy click-through links to a wealth of science resources and information.
- **Quarterly Comprehensive Science Resource & Educator Opportunities Guides** (up-to-date listings of exhibits, material and lesson planning, professional development, websites, classroom grant opportunities, and much more)
- Invitations to **Science Field Trips for Teacher resource workshops at local science centers.** Events this year were held at NatureBridge, the Marine Mammal Center, and



the Crucible Industrial Arts Center. Participating resource partners included Oakland Museum, Chabot Space and Science, Kids on the Bay, East Bay Regional Parks, and more. Each event featured free take-away resources, available consulting assistance, and regional science providers highlighting their programs and services.

- Round the clock **access to the online resources** which include teaching tools, lesson plans, tips, treasure trove websites, and the **CRS Science Resource Database**, a curated, searchable online database covering the comprehensive array of Bay Area science programs, services, funding opportunities, and more.
- **Customized science research based on individual teacher requests.** Teachers asked for CRS support in finding specific information about field trips, in class enrichment providers, lesson planning and activities, websites, background information, grant and professional development opportunities, and more.

Free, In-Class, Hands-On Science Lessons: Bay Area Scientists in Schools (BASIS) Program



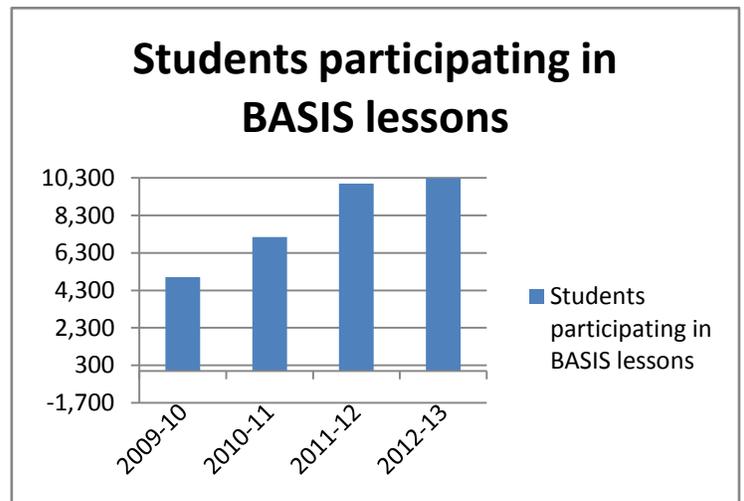
CRS teacher members were invited to apply for standards-based in-class science lesson presentations by our BASIS scientist volunteers. These are offered, at no additional charge, on an as-available basis to supplement CRS science support and to build teacher knowledge and enthusiasm for incorporating science into their classrooms by demonstrating the power of scientific activities for engaging all kinds of learners in hand-on, exciting, and ‘real world’ science.

This year CRS recruited, trained, and placed over 500 scientists who provided 456 BASIS presentations in all the schools we serve. There are 100 BASIS lessons currently in circulation for classroom presentations. Sample list of BASIS presentations below.

In addition to these K-5 Science Connections Program accomplishments, CRS work with districts during the 2012-13 school year included:

Connection requests and specialized assistance

- Recruiting scientists to present at the SMART Center teacher professional development sessions



- Developing a bird dissection workshop for High School biology teachers and students
- Facilitating connection requests for family science night events, science fairs, and other school site events seeking speakers, presenters, and judges
- Specialized assistance such as facilitating donation of a large aquarium and related equipment for a lead science teacher, assisting teachers learn how to use donated equipment such as microscopes

Hands-on outreach, science activity tables for students, families, and teachers, including

- OUSD Science Fair, Chabot Space and Science Museum
- Recruiting scientist participants and assisting at Dinner with a Scientist events.
- Assistance with various school site Family Science events and school science fairs
- Bay Area Science Festival, Farmers Markets, Cal Day, Science@Cal, and other community outreach events

Science Super Star Challenge Program

Three entire schools and more than 50 teachers at a dozen schools were successful in meeting the challenge and earning recognition. Teachers completing a series of best practice elements (hands on investigations, reading and writing activities connected with science, field trips or in-school presentations, professional development) were awarded prizes that included museum passes and class field trips, on-site assemblies, books, Flip video cameras, and more. Every student – over 2,000 in all – received a small science tool such as a magnifying glass and their very own science related book to keep.



Science Super Star Whole Schools:

- **Lafayette Elementary, Oakland:** Principal Eddie Scruggs-Smith. Teachers: Byron Delcomb, Corrigan Malloy, Russell Cohen, Gloria Williams, Angelina Gilyard-Shyne, Sharon Travers, Arvella Hayden, Carmen Hendon, John Morgan
- **PLACE @ Prescott, Oakland:** Principal Enomwoyi Booker. Teachers: Lorraine Mann, Cicely Day, Claudine Wright, Janina Ivester, Linda Fox, Adriana Guadarrama, Constance Cobb-Zunino
- **Chabot Elementary, Oakland:** Principal Jonathan Mayer. Teachers: Miranda Carrow, Joon Yeider, Danny Nagatani, James Harrison, Jennifer Brackett, Darlene Perdistatt, Kyle Wong, Deborah Flanagan, Amy Moscato, Phoebe Diamond, Brennan Agajan, Celia Bermeo, Doshia Battiest, Leslie Rychel, Meghan Shaughnessy, Andrea Trautman, Pearl Rapson, Laura Shield, Daniel Villareal, Anna Forward, Dianna Schonfield

Science Super Star Classrooms

- **Berkeley Arts Magnet, Berkeley:** Kristine Fowler

- **Bridges Academy at Melrose, Oakland:** Ann Park, Candice Camp, Jessica Jung, Rosa Kurshan-Emmer
- **Burckhalter Elementary, Oakland:** Lille Hayes-Staples, Lisa Capuana Oler, Meghan Whitacre, Candace Harper
- **Community United Elementary, Oakland:** Linda Selph
- **Encompass Academy, Oakland:** Liz Cruger
- **Howard Elementary, Oakland:** Randy Sherren, Mary Hill, Colleen Shepherd
- **Laurel Elementary, Oakland:** Lise Yskamp
- **Lincoln Elementary, Oakland:** Allison McGuirk
- **Martin Luther King Jr. Elementary, Oakland:** Lindsey Smallwood
- **New Highland Academy, Oakland:** Tracy Dordell, Joanna Davis
- **Oxford Elementary, Berkeley:** Sarah Ellberg, Shay McGilvrey, Jaime Vines, Jacqueline Omania
- **Parker Elementary, Oakland:** Kathryn Mapps

Evaluation of Impact



CRS conducts post-BASIS presentation surveys of teachers, and a comprehensive year-end overall program evaluation survey for teachers, along with a separate year-end program evaluation survey for volunteers. Throughout the year, and at the conclusion of the year, CRS analyzes empirical and narrative responses, adjusting program practices and making refinements as needed. Responses over the years have consistently shown this program to be a

substantial success, rating very highly in areas of teacher and scientist volunteer engagement and satisfaction. Other measures, such as growth in the number of teachers served, growth in the number of teacher information requests fulfilled, and growth in numbers of volunteers recruited, prepared, and placed in classrooms, also point to the project's success.

Summary of Teacher Responses

On the year-end survey, yet again **all teachers reported that their students respond positively to science experiences**, yet most of these teachers also indicate they spend “too little” time teaching science. However, survey responses do indicate that overall teachers are becoming more confident and enthusiastic about including science learning experiences for their students and that CRS services help to increase both the quality and quantity of science in their classrooms.

As a direct result of CRS support services teachers indicated they:

- Increased the amount of science they teach 80%
- See how effectively science activities engage all types of students 83%
- Know where to find information and science teaching resources 85%

- Added a new field trip, lesson or activity 83%
- Became more enthusiastic about science teaching 81%
- Know where to ask for help with resources and planning 79%
- Became more informed about available science resources 87%
- Feel more confident professionally 65%

Of teachers who had a BASIS in class presentation, all reported being satisfied with the presentation and plan to request one again. Specific benefits cited include Observing my students' engagement in the BASIS activity encouraged me to include more hands-on science activities in my classroom. 88%

Presentations helped dispel student stereotypes of "who" is a scientist 95%

Through BASIS activities, teachers said students:

- Grew more interested in science 100%
- Connected what we learned in the classroom with experiences in their lives and the real world 100%
- Asked thoughtful questions 99%
- Were engaged in hands-on experiences 98%
- Discussed their own science observations and ideas 98%
- Effectively learned new science concepts 95%
- More clearly understand that science is a process, not just a bunch of facts 95%

Over three-quarters of teachers reported being surprised by at least one of their students participating or demonstrating skills above his/her typical classroom level, showing them new ways to engage this student through hands-on activities.

To our delight, **teachers continue to indicate they are spending more time teaching science**, with only 13% indicating they teach 2 hours or less per month (down from 18% last year, continuing a trend of increased time devoted to science). About one third of teachers indicate they teach science at least once per week, with an average of 3-4 hours per month. This represents a gradual continuation of the increase in science teaching we measured last year among the teachers CRS serves. Likewise, principals are seen as more supportive of the importance of science teaching (from 74 to 76%). **This continues to underscore a growing awareness and commitment, particularly in the Oakland schools we serve, regarding the importance of science in elementary classrooms.**

Representative Comments from Elementary Teachers:

Throughout the year, and on the end of year and post-presentation evaluations, teachers share their thoughts, concerns, and feedback with CRS. As a learning organization, we take these comments to heart and work diligently to address the changing needs of teachers, and the tremendous range of needs our teachers articulate. Regarding the **BASIS program**, the

comments are overwhelmingly peppered with the phrases: **phenomenal, fabulous, my kids loved it, thank you, and MORE PLEASE!!**

Teachers consistently rate our services highly and indicate that CRS services increase the amount of science they teach, increase their confidence and content knowledge, and spark their own enthusiasm for science learning. Here are some representative teacher comments:

Beautiful presentation! The students had a wonderful time. They were very engaged and excited about the scientific concepts at hand. The activities led them to make connections between what they already knew about the brain and what they were learning, and to continue formulating scientific questions and hypothesis relating to their budding understandings of human body systems. Very well done. – Jenny Wegner, Futures Elementary, OUSD, 5th Grade

*My students really like the hands on components to the three activities. They also like the "opening" demo/problem that hooked them into the lesson. But, I think that after their interest in the science experiments **they became excited to hear about the various applications of science in the real world. My students were curious to learn about the research that the three scientists were conducting. They marvel at the idea that science is currently changing the world around them.** –Daniel Villareal, Chabot Elementary, OUSD, 4th Grade*

The science Super Star challenge was a great way for me to motivate and encourage some of the teachers at our school who are not as "into" science. Getting to 14 hands-on activities was a real challenge for some teachers and this motivated them to push ahead and do more investigations. JP, Lead Science Teacher, OUSD

Some teachers didn't think they had done much writing, but then I went to their rooms and they pulled down thick binders full of student writing on worksheets, journals, data gathering sheets, and more and they realized how much writing they do as part of teaching science. This program helped to make that connection visible to some of our teachers. Lorraine Mann., OUSD Lead Science Teacher

After the lesson I asked students about their experience, they wanted to tell me about what they learn. We really had an engaging science talk. They were eager to use new and some familiar vocabulary. Many were enthusiastic about the prospect of building another solar car. Some expressed new concepts such as wind being a source of power. I was impressed by how much this lesson solidified their knowledge about environmental studies. Constance Cobb-Zunino, Place@Prescott

My students who have no background at all in materials, used a lot of vocabulary words afterwards. During free choice time, they continued to try and build structures with papers. Thanks a lot volunteers. You've made a difference in someone's life today!-Cindy Chu, Bella Vista Elementary

The students were really excited and it was so nice to have so many volunteers to lead small groups through the activities and give them some time to ask questions in a personal way. The flow of the lesson worked really well and it was something new for my students that they can now explore a bit on their own too!----- Leah Wachtel, Bella Vista

My students LOVED this presentation. They talked about it all day (which is remarkable, given it was Valentine's Day!) and the other 5th grade class was jealous! The volunteers were very relaxed and

confident, which made the students responsive and willing to take intellectual risks. They are already looking into other activities which they can use in developing Science projects of their own. Leslie Hanna, Korematsu Discovery Academy

This is the first year that I have really focused on teaching Science. I always taught the least number of minutes when it came to Science. I have since learned to incorporate other subjects with Science, so that I can teach Science much more throughout a normal school day. To be honest, at first (I taught science) because I was being monitored on how many minutes I was actually teaching Science. But, it turns out that kids love to learn and explore science. This has increased my interest in teaching science and I love that my students are engaged in the activities. Teaching science gives students the opportunity to predict and explore themselves and to see the world scientifically. CRS is a resource that helps us teach science to our children. I should use CRS more often and I hope to in the future. This is the first year we have prioritized science and I am at a new school, so I hope to feel more comfortable next year and increase my involvement with CRS. – Burckhalter Elementary, Science Super Star awardee

Teaching science is about helping students understand how the world around them works. From what happens when you make pancakes to why you need sunlight to grow a garden, science helps students make sense of their lived experience and exposes them to life beyond their own community. CRS is such a valuable resource - especially their BASIS program which brings real-life scientists into public school classrooms like mine to "do science" with students. The hands-on lessons that they tailor to the needs of each classroom allowed my students to make sense of some difficult science concepts we've been studying this year. Lindsey Smallwood, MLK Jr. Elementary

Nothing but compliments! They were so open, respectful, and interested in the students and that really came across. The activity was directly related to upcoming curriculum and I love it when the presentations are so standards-based. It really augments our science programs. It was great that they were also so supportive of my interjections to make sure that we could relate the material to vocabulary learned in class and stretch it from there! More, more, more. This is a great example of a terrific program that you offer. Many thanks to all involved! Kristine Fowler, Berkeley Arts Magnet

This lesson was amazing!! The volunteers were so well prepared, kid friendly, and engaging. The kids were so excited and learned some basic vocabulary about heat transfer. It was such a great hour of time. I cannot speak highly enough of the volunteer group that came to our class, they were awesome! ----- Annie Muse-Fisher, Washington, BUSD

I love that the volunteers looked like the mix of students I have in my classroom. They were fabulous and as a bonus present good role models for my students. ---- Cheryl Sheppard, Oxford Elementary, BUSD

Sample comments from our BASIS volunteers:

The buzz of Science was obvious...more so when the team pulled out a box full of supplies (thank you, CRS!) to have each student make their own balloon rocket car! All 24 students, including Sam, who seemed to be having a rough day at school that day, were smiling by the end of one hour! Most cars zoomed and raced away, a few needed minor adjustments, perhaps some hypotheses, and further experiments to make them work...nothing that these young minds can't do in their free time in the coming days!

Great overall experience for all 4 of us, yet again! I am amazed how much I learn, every time I get to participate in a classroom event! Thank you CRS and Clorox Sci Ed team for giving us an opportunity and platform to make a difference at a small yet satiating level!

Team balloon rocket car, keep up the amazing work! Thank you!"

--Arun Agarwal, Clorox

Ann Park is the best! We went an hour early to hear the students read stories to us one-on-one, and Ann fed everyone bagels and juice. One of my best BASIS moments so far: A student who was in Ms. Park's class two years ago came by to say hi because she remembered my visit two years ago so fondly. In case we were wondering if these things have a lasting impact! – Bergman lab group leader

I enjoy experiencing the curiosity and enthusiasm of the students as they make their own little discoveries for the first time. Their excitement reminds me of why I chose a career in science. -- Kate Alfieri

I love sharing my passion for science with younger scientists, seeing them light up about the world around them invigorates me to do the same--its a mutually reinforcing experience, they show me a science driven by curiosity and I hope to show them where that curiosity can take them. – Natasha Naidoo

It is great to have that connection to the youth and the community. It is easy to lose track of that connection in day to day work. It inspires me to do a better job, so that I can be a role model. If even one kids thinks a little more about science because of our visit, it's worth it. Kaye Cowen

Representative frequent student comments included:

Thank you! I want to be a scientist, too!

It was cool! I learned a lot. Science rocks!

It was fun to hear about the stuff they are doing in their labs.

It was mesmerizing. You guys made me really want to learn more about chemistry.

Thank you for teaching us about weather. I love science!

This was an interesting and special experience that I will always remember.

When I get older now I might want to work as a scientist.

"Please, please, please, please, please come again someday."

That was the coolest thing and experiment I have ever done before in my life.

I really hope you come to our class again and do science. I had a wonderful time with you.

Please come back so I can learn more stuff!

I had a great, great, great, great, great time. It was very, very, very, very fun.

In addition to these K-5 Science Connections Program accomplishments, CRS work during the 2012-13 school year included:

Workshops for educators, including:

- Hands-on Activities for Afterschool Providers, through Alameda County Office of Education and the STEM Power of Discovery network
 - Connecting middle school in-class and afterschool activities, lesson development with Gateways Network at Cal State East Bay STEM Institute
 - Presentations at the International Scientist Teacher Connection Conference, Boston
- Ongoing work of the CRS Advisory Council on Elementary Education
- Bay Area thought leaders in science, education, academia, business, and philanthropy
 - Action oriented, focused on solutions to challenges in elementary science education

CRS & BASIS scientists developed and presented lessons on more than 100 topics, including:

Hidden Colors	K	Soil: The Ground We Stand On	
Glow in the Dark Science	5th	(Sheena-ELP)	2nd
Natural Selection: Clipfish	3rd; 4th	Who Is In Your Group? - Grouping	
The Sun, the Moon, the Stars in the Sky, Oh My!	4th	Vertebrate Animals	K
Hidden Colors	3rd	Impact of Diversity Within an Ecosystem	3rd
Melting, Freezing, and More!	K	Squishy Circuits	4th
Bob MacDonald - Presentation	3rd - 8th	Water in our Atmosphere: Make It Rain!	5th
Gears in Motion	2nd	Stanford ASB: Boat Challenge	2nd
How to Get Renewable Energy from the Sun	3rd	Animal Body Structure and Habitat	1st
Build A Bug	K; 1st	Natural Selection and Biodiversity with Worms?	3rd
Materials and Structures	2nd	Roots, Shoots, and Leaves - Picking Plants Apart!	K
Fossil Frenzy	2nd	Orbits make days, nights, and seasons!	3rd
Solids, Liquids, where are the Gases?	1st	Elements of Life	5th
Wildfire	4th	Hereditary Traits: What Makes Us Special	2nd
Light and the Electromagnetic Spectrum	3rd	Picture Perfect Plants	K
Electricity, Magnetism and the Wall Socket	4th	Stanford ASB: Egg Drop Challenge	2nd
Chemistry ?Magic!?! - Chemical and State Changes	5th	Lion Eats the Antelope (Food Chains)	4th
Working with Water	K	Head, Shoulders, Knees, and Toes!	
We Love Gravity!	5th	Learning About Our Body Parts	K
Three States of Water	1st	Bones, Muscles, and How We Move	5th
Plastics, Recycling, and Composting	5th	Bird Beak Buffet	3rd
Seeing is believing?	3rd	Plant Life Cycles & Reproduction	2nd
Pictures in the Sky	3rd	DNA Discovery	5th
Fossil Formation	2nd	What does my heart really do?	5th
Magnets are Sweet	2nd	Marshmallow Challenge: A Tower Building Adventure	2nd
Clouds Clouds Everywhere	1st	Water Water Water	K
		Heat Transfer: It's so cool!	3rd

Properties of Matter that Matter	3rd	Feel Dead Brains	5th
Vision Whitney Lab	6th	Why Do Animals Migrate?	4th
Mountain Building	6th	Exploring States of Matter	1st
Optics & Reflection	8th	Brains - Spiker Box	5th
Clipfish	6th	What is Renewable Energy?	4th
The Eight Phases of the Moon	3rd	Balloon Rocket Cars	2nd
Chemical Reactions	5th	Dissecting Dinosaurs: An exercise in bird anatomy and evolution	9th-12th
CSI: Chromatography Science Investigation	5th	Curious Critters - Ocean and You	1st
Zap, Crackle, and Pop: Static Electricity Everywhere	4th	Constructing Ocean and Jungle Food Webs	4th
Balloon Rocket Cars (Bayer)	2nd	Having Fun with Magnets	4th
Skeleton Leaves	1st	A Field Trip Through the Digestive System	5th
Hear All About It! ? Sound	2nd	Open Scope: Build Your Own Microscope!	3rd
Plants Show Their True Colors	5th	Matter: A Periodic Puzzle	3rd
Brain Matters	5th	Shalom's Sounds of Science	3rd
Waves, Sound Strings, and Musical Instruments	2nd	Why don?t dogs live in a pineapple under the sea?	1st
Soils: The Ground We Stand On	2nd	Energy: The Currency of Science	3rd; 4th
Eating the Sun	4th	How Your Heart Works	5th
Simple Machines: the Application of Forces	2nd	Clorox Day of Science	
Germs and Your Body	K	Botany on Your Plate (Spanish)	1st
Plant Life Cycles	2nd	Brain Science	7th
Periodic Table	5th	Solar Winds	8th
A Whole New World of DNA and Proteins	5th	Spring Mechanics	7th
Properties of Materials	5th	Responsible Consumerism and the Legacy of Marine Debris	1st-5th
It came from a single cell	5th		
Chemistry of Soap	5th		
Follow the River to Clean Waters	5th		
How to Think Like a Scientist	5th		