

**EVALUATION REPORT FOR THE
BAY AREA EARTH SCIENCE INSTITUTE:
SUMMER 2008 WORKSHOP
(JUNE 23 – 27, 2008)**

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Bay Area Earth Science Institute (BAESI) Workshop and Field Trip Evaluations - Spring 2008

Overview

With support from Intel Corporation, the House Family Foundation through the Collaborative for Higher Education, and a Department of Education Teacher Quality grant (to Amy Strage, SJSU College of Education) the Bay Area Earth Science Institute (BAESI) offered a workshop on California's Resources for middle and high school teachers during the week of June 23 – 27, 2008. The workshop was keyed to the California science standards and included exploration of renewable and non-renewable resources, water sources, supply, and quality, useful rocks and minerals, fossil fuels and climate change, and alternative energy sources.

The workshop met daily from 9:00 a.m. to 3:30 p.m.; the daily schedule is included in the Appendix.

The evaluations for the workshop are listed below.

Teacher Evaluations (3 evaluations)

- Teachers' Pre- and Post-workshop Personal Knowledge Survey
- Teachers' Pre- and Post-workshop Teaching Efficacy Survey
- Teachers' Post-workshop Survey

Activity Evaluations (6 evaluations)

- Energy Round-up Activity
- Cookie Mining Activity
- Renew-a-Bean Activity
- Solar Energy Kit Activity
- Water Concentration Activity
- Taste Test Activity

Field Trip Evaluations (3 evaluations)

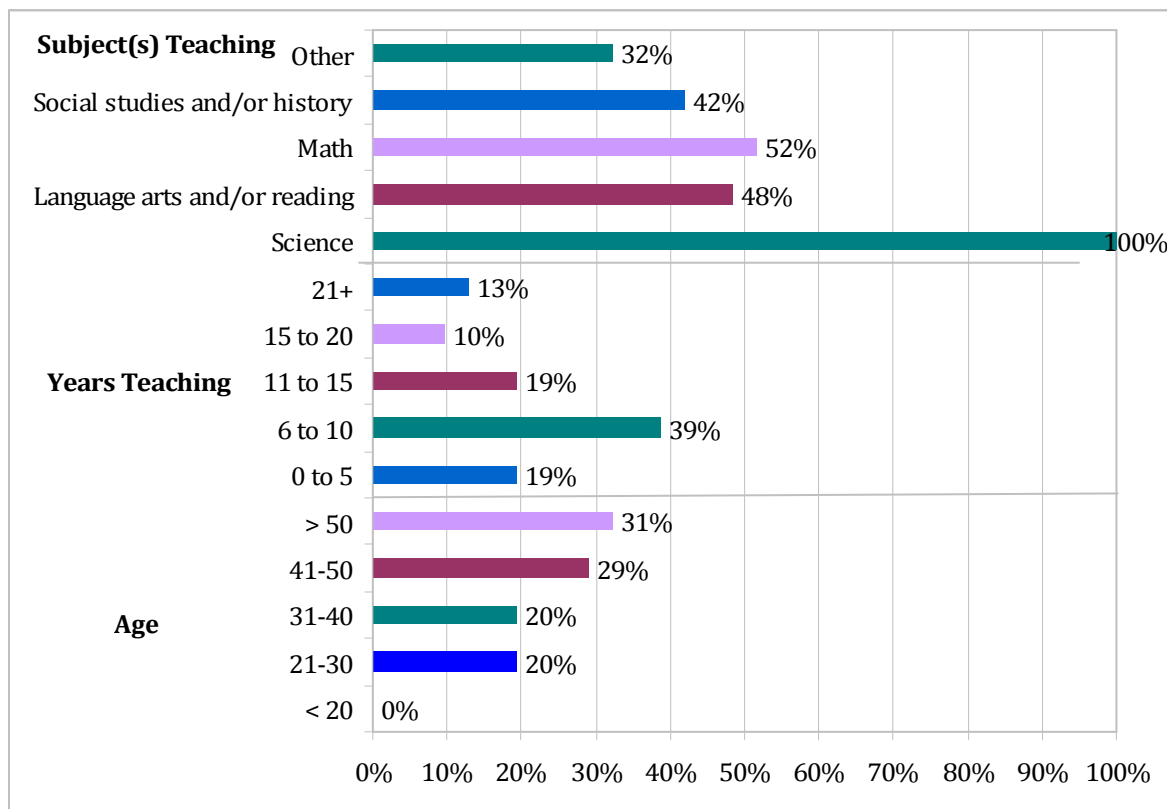
- Santa Clara Valley Water District Field Trip
- Tech Museum Field Trip
- Green Team Recycle Center Field Trip

Additional Evaluations (2 evaluations)

- Speaker Evaluation, Speaker: Mary Morse
- Computer Experience Evaluation, Computer Activity: Carbon Footprint

Thirty-one teachers (27 females, and 4 males) completed pre- and post-workshop surveys on demographics, teaching background, personal knowledge and teaching efficacy, and classroom characteristics. The majority of teachers were White (not Hispanic) (n = 22, 71%), and a few were Asian (n = 6, 19%). Two teachers were Hispanic/Latino (7%) and one teacher was biracial (3%) in race/ethnicity. Ninety percent of teachers possessed teaching credentials (n = 28). Over half of the teachers were 40 years of age and older, and all have taught science classes. Two are paraprofessionals or classroom aids, and another two are tutors or mentors. They have had an average of 12 years of teaching experience (range = .5 to 42 years) (see Figure 1).

FIGURE 1: Teacher Characteristics (N = 31)



Note: Teachers may have responded to teaching more than one subject.

Teacher Evaluations

Below are the results of the pre- and post-workshop survey of teachers' personal knowledge and teaching efficacy of specific areas covered in the workshops and field trips. The eight areas covered in the survey are as follows: general knowledge; fossil fuels; alternative energy sources; mineral resources; water resources; the greenhouse effect; climate change; and recycling and waste management. Teachers' average ratings of personal knowledge in all areas increased from pre- to post-workshop. Similarly, teachers' average ratings of teaching efficacy increased from pre- to post-workshop. The workshop activities and field trips showed to have benefitted teachers by increasing their knowledge and teaching efficacy.

Teachers' Pre- and Post-workshop Personal Knowledge Survey

Pre N = 31, Post N = 31	Average Rating	Excellent (5)	Good (4)	Satisfactory (3)	Poor (2)	None (1)
General Knowledge: I'd rate my personal knowledge of general Earth Science as...						
Pre Workshop	3.61	3%	58%	35%	4%	0%
Post Workshop	3.97	19%	58%	23%	0%	0%
Fossil Fuels: I'd rate my personal knowledge of fossil fuels as...						
Pre Workshop	3.13	3%	32%	39%	26%	0%
Post Workshop	4.03	19%	65%	16%	0%	0%
Alternate Energy Sources: I'd rate my personal knowledge of alternate energy sources as...						
Pre Workshop	3.26	3%	32%	52%	13%	0%
Post Workshop	4.06	26%	55%	19%	0%	0%
Mineral Resources: I'd rate my personal knowledge of mineral resources as...						
Pre Workshop	2.90	3%	13%	58%	23%	3%
Post Workshop	3.87	16%	55%	29%	0%	0%
Water Resources: I'd rate my personal knowledge of water resources as...						
Pre Workshop	3.42	10%	35%	45%	6%	4%
Post Workshop	4.23	29%	65%	6%	0%	0%
The Greenhouse Effect: I'd rate my personal knowledge of the greenhouse effect as...						
Pre Workshop	3.42	3%	48%	39%	6%	4%
Post Workshop	3.93	23%	50%	23%	4%	0%
Climate Change: I'd rate my personal knowledge of climate change as...						
Pre Workshop	3.26	3%	35%	48%	10%	4%
Post Workshop	4.03	23%	57%	20%	0%	0%
Recycling and Waste Management: I'd rate my personal knowledge of recycling and waste management as...						
Pre Workshop	3.48	13%	29%	55%	0%	3%
Post Workshop	4.13	37%	40%	23%	0%	0%

Teachers' Pre- and Post-workshop Teaching Efficacy Survey

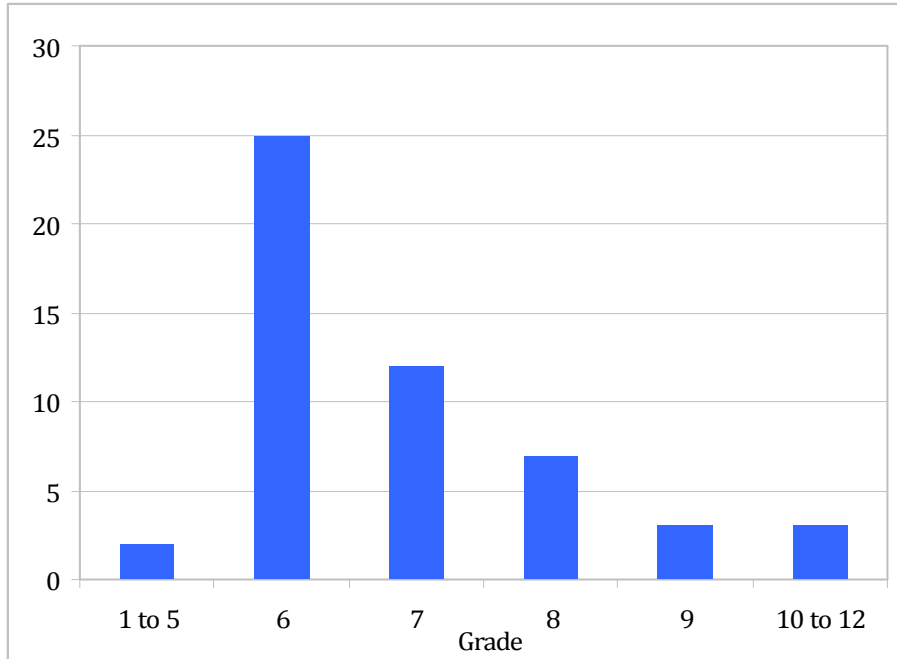
Pre N = 31, Post N = 31	Average Rating	Excellent (5)	Good (4)	Satisfactory (3)	Poor (2)	None (1)
General Knowledge: I'd rate my ability to teach Earth Science as...						
Pre Workshop	3.58	13%	42%	35%	10%	0%
Post Workshop	4.03	23%	57%	20%	0%	0%
Fossil Fuels: I'd rate my ability to teach concepts associated with fossil fuels as...						
Pre Workshop	3.00	0%	29%	42%	29%	0%
Post Workshop	3.97	16%	58%	23%	0%	0%
Alternate Energy Sources: I'd rate my ability to teach concepts associated with alternate energy sources as...						
Pre Workshop	3.16	3%	32%	42%	23%	0%
Post Workshop	3.97	19%	58%	23%	0%	0%
Mineral Resources: I'd rate my ability to teach concepts associated with mineral resources as...						
Pre Workshop	2.87	3%	16%	48%	29%	4%
Post Workshop	3.94	19%	55%	26%	0%	0%
Water Resources: I'd rate my ability to teach concepts associated with water resources as...						
Pre Workshop	3.39	10%	35%	42%	10%	3%
Post Workshop	4.19	29%	61%	10%	0%	0%
The Greenhouse Effect: I'd rate my ability to teach concepts associated with the greenhouse effect as...						
Pre Workshop	3.35	3%	45%	39%	10%	3%
Post Workshop	3.90	20%	53%	23%	4%	0%
Climate Change: I'd rate my ability to teach concepts associated with climate change as...						
Pre Workshop	3.16	3%	35%	39%	19%	4%
Post Workshop	4.03	23%	57%	20%	0%	0%
Recycling and Waste Management: I'd rate my ability to teach concepts associated with recycling and waste management as...						
Pre Workshop	3.55	13%	35%	48%	0%	4%
Post Workshop	4.07	30%	47%	23%	0%	0%

The post-workshop survey also included questions about classroom characteristics. This year, teachers taught an average of 137 students (range = 15 to 540, median = 90 students, with two missing responses). The number of students from under-represented groups ranged from 0 to 400 (average students = 71, median = 48).

Teachers varied in how many grade levels and subjects they taught. Some taught only one grade level, while others taught as many as three grade levels (e.g., 6th, 7th, and 8th grade). Specifically, 25 of 31 teachers taught 6th grade, while 12 taught 7th grade, 7 taught 8th grade, three taught 9th grade, two taught 10th grade, one taught 11th and one

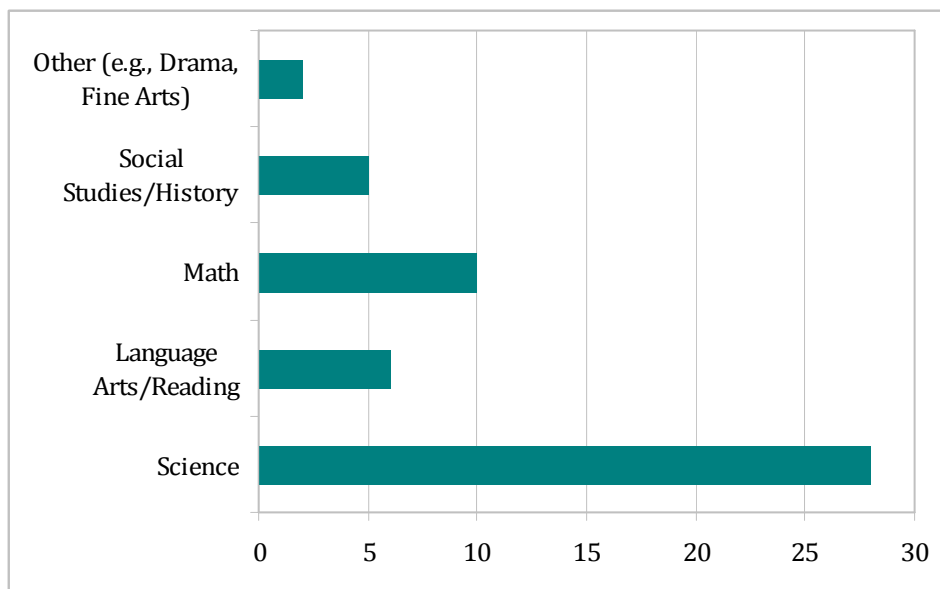
taught 12th grade. Most teachers taught sixth and seventh graders in science and math classes (see Figures 2 and 3).

FIGURE 2: *Teachers and Current Grade Level(s) Being Taught (N = 31)*



Note: Teachers may have taught more than one grade level.

FIGURE 3: *Teachers and Current Subject(s) Being Taught (N = 31)*



Note: Teachers may have taught more than one subject.

Teachers' Post-workshop Survey

Thirty teachers completed the post-workshop survey of workshop effectiveness, ideas/strategies, academic content, and presentation. These questions are followed by teachers' greatest learning at the workshop, the strengths and weaknesses of the workshop, as well as suggestions about future workshop content and format.

How effective was this workshop in teaching you Earth Science concepts? (Mean rating= 3.67)		
Rating	Number	Percent
Not at all effective (1)	0	0%
Somewhat effective (2)	2	7%
Effective (3)	6	20%
Very effective (4)	22	73%
Total	30	100%

How useful was this workshop in giving you ideas and strategies you can use in your science classes? (Mean rating= 3.53)		
Rating	Number	Percent
Not at all useful (1)	0	0%
Somewhat useful (2)	4	13%
Useful (3)	6	20%
Very useful (4)	20	67%
Total	30	100%

How difficult was the academic content of this presentation? (Mean rating= 2.97)		
Rating	Number	Percent
Very difficult (1)	0	0%
Somewhat difficult (2)	4	13%
About right (3)	23	77%
Easy (4)	3	10%
Total	30	100%

How would you rate the workshop leader(s) in terms of being prepared, presenting information clearly and effectively, and responding to questions? (Mean rating= 3.63)		
Rating	Number	Percent
Poor (1)	0	0%
So-so (2)	3	10%
Good (3)	5	17%
Outstanding (4)	22	73%
Total	30	100%

What do you consider your greatest "learning" in this workshop?

- Information and activities that I can use with my classes to teach them the importance of Climate Change and what they can do to help solve the problem.
- The specific details on how the natural resources fit into the spheres of Earth.
- A whole bunch of stuff I didn't know before.
- I have a much better understanding of climate change and peak oil.
- Concept of peak oil and the urgency of the issue. The ANWR activity was great.
- The fossil fuel problem - did not know it was so bad or so imminent.
- Concepts around climate change and global warming, peak oil.
- Hands-on activity, its creativity for student comprehension on abstract concepts.
- Fossil fuels and recycling.
- Fossil fuels are running out. Gas prices aren't just trickery.
- Better understanding of the global petrochemical situation.
- Background information about oil and climate change.
- 1. Educational Resources available to me 2. Climate change immediacy 3. Resource depletion immediacy.
- Fossil fuels and climate change.
- Hands-on activities to use with students.
- The global warming/peak oil presentation.
- We can all make a difference in saving the environment.
- I liked the info on climate change. It was current and relevant regardless of grade level.
- I enjoyed the climate change lectures.
- That the context of earth science and resources will support students learning in math, real live applications make sense.
- The depth of analysis in regards to the water use, fossil fuels, climate change and how it's affecting us and will affect us in the future.
- Peak oil/oil exploration.
- Oh brother its hard to say since I feel I learned so much! Probably my understanding of climate change would be the greatest!
- The solar cells (good explanation accompanied by kit).
- I liked the cookie mining and solar cells.
- How to apply the concepts taught into hand on lessons.
- Learning more about the concept of climate change and energy crisis and ways to help solve the situation.
- Putting together the solar fan, mining the cookie, calculating the energy uses were my "greatest learning" in this workshop.
- Climate change and how it affects the world.
- We need to make changes NOW!

Identify 3 strengths in the Bay Area Earth Science Institute workshop series.

- 1. Very content knowledgeable instructors. (experts) 2. Lots of ideas that I can use with my classes. 3. Introduction to a wide variety of resources that will support my lessons.
- 1. Gives lessons and activities. 2. non-competitive environment 3. opportunity to network with other science teachers with diverse experiences/backgrounds and with "experts" from the field.
- 1. Topical information which has practical everyday applications. 2. Excellent way of presenting materials some of which can be a little "Dry" 3. Great 'down to earth' staff (pun intended).
- First and foremost - the instructors, Ellen and Richard their ability to put together and teach such educational workshops 2. The materials a great balance of background information and activities all well explained. 3. The inclusion of field trips which are possibilities for students as well, but if not we learned a lot from them.
- Highly knowledgeable staff good integration of content and classroom strategies interesting presentations and activities
- 1. The knowledge of the instructors. 2. Enthusiasm for subject matter. 3. Practical hands-on activities.
- 1. Hands-on interactive activities and strategies 2. Appropriate grade level information 3. Generosity in providing stipends to attend workshop.
- 1. Creative hands-on activities. 2. Full of information. 3. Nicely organized workshop.
- 1. Hands-on activities 2. Topics adoptable to different students level 3. Variety of activities and hands-on materials for teachers.
- Combination of activities, computer resources, and presentations in classroom and community.
- 1. Timely topics 2. Balance of content and teaching strategies 3. lot of material and resources.
- Providing background info for teachers (at adult level) 2. Knowledgeable instructors and presenters from industry 3. Provide lessons that can be used in class.
- 1. Preparation 2. Personalities of instructors 3. Balance of pedagogy and instruction.
- 1. Personable leaders 2. Straight to classroom resources 3. Variety (lessons, info and activities).
- 1. Hands-on projects were great 2. Instructors were very knowledgeable and helpful 3. treats (food) were great! Loved the relaxed environment.
- 1. Instructs & informs teachers of Earth Science content 2. Supplies many hand-on, inquiry-based activities we can implement in the classroom 3. Free materials.
- 1. Very comprehensive 2. Strong science content that aligns with the California standards 3. Hands-on and engaging activities.
- 1. Ties to standards 2. Gives teachers more in-depth knowledge to support their teaching 3. Balance between content and activities 4. Plus stipend!

- 1. Most lessons would work well with students 2. Love the website a great resource 3. Richard's presentations were especially interesting and challenging I felt I learned a lot.
- 1. Expertise and knowledge of presenters 2. Modeling activities to use with students 3. Activities address key concepts.
- The depth of the information shared, the practical activities to implement in the classroom and the resources to which I now have access.
- 1. Practical lessons 2. Content timely to current events 3. good variety of topics
- 1. Clear, focused teacher education 2. appropriate/related student activities 3. Extremely knowledgeable instructors.
- 1. Hands-on material 2. Science content 3. Use of technology (internet).
- 1. Good topics 2. Lots of activities 3. Field trip
- 1. Hands-on activities 2. Content knowledge 3. How material was presented.
- 1. Well organized 2. Academically useful/knowledgeable presenters 3. Great hands-on activities.
- 1. Hands-on ideas 2. Providing us with materials 3. Experiencing the activities.
- 1. good ideas and lessons to be used in the classroom 2. free materials 3. info at a greater depth.
- 1. Content coupled with hands-on 2. you really know your stuff and are able to explain things very well 3. you model what you preach.

Identify 3 areas to improve in the Bay Area Earth Science Institute workshop series.

- 1. A longer day. 2. More time on the field trips.
- 1. Bring in others from campus in different departments to be additional experts. 2. Break out sessions where we can go more in depth or look at web resources, or get more basics, or share more classroom ideas.
- 1. Classroom a little too crowded. 2. I prefer a longer day with one hour lunch. 3. A bus would have been more practical for field trip - and more energy-efficient.
- This is difficult..., I like the balance of background info vs. activities but sometimes find I still have many questions. So continuing to offer more about these topics would be a way to improve that aspect.
- I am tempted to personally provide a bullhorn to cope with the people who don't shut up and listen. I'm afraid teachers are the worst in this request.
- BAESI has requested feedback and improved so well, I can't think of anything significant.
- I thought it was great!
- Lunch time, teacher networking, future workshops, email notification.
- Reinforce silence among chatty teachers.
- 1. transportation for long distance field trips 2. Color hand outs (perhaps) and folder/binder to keep them.
- Follow up sessions.
- 1. Less paper use; 2. Occasionally presenters went off topic.
- 1. Teachers can do one of the 90 min labs when visiting The Tech 2. Doing the climate, oil press for 1-2 hours over the course of the 5 days, instead of saving all of it for Thurs/Friday. It was too much info to digest in one sitting.

- Just to go along with the theme of this workshop - electronic with surveys and use less paper.
- 1. More time at the Tech. 2. "Green Team" and SCVED in one morning too rushed. 3. A bigger venue or room maybe.
- Use technology more. This was not a high tech workshop and really could have been. More "wow-factor" in teaching tools - even if they are expensive.
- 1. Identify standards 2. After doing a few BAESI classes many activities are repeated need fresh ideas 3. More hands-on activities.
- Workshop was very effective and enjoyable.
- Expand grade levels (not the same workshop necessarily).
- 1. Better planning 2. More correlations to standards 3. More relation to 6th grade teacher.
- 1. Organization on agenda. 2. Picking the important aspects I know that you won't cover it all. 3. Could use more labs and who it should be geared to teachers who teach all science or self contained class room.
- More hands-on activities. There is never enough.
- 1. Make them longer (2 weeks rather than 1 week) 2. Provide buses or vans to ride us to fieldtrips
- None.
- 1. Have an agenda in place 2. Longer (adequate) time for field trips 3. More hands-on activities.
- I'd like fuller more developed lesson units - maybe time to pull together. I'd have a lot of activities now that I can go and plug into existing but I've got a lot of work to do.

Please provide any written feedback that you wish to include regarding the overall workshop.

- It was definitely a worthwhile week. The pace was very well thought out.
- One of the best I have attended; leave crazy AI out of future discussion of climate change.
- I am always so impressed by the amount of information and materials that are packed in to any workshop I have been to. It is such a great support for teaching.
- This was a great week thanks so much for all the great info, handouts, treats and generous stipend!
- I thought it was great and I appreciate being able to attend. I've gained a lot of knowledge and concepts I can implement in my classroom. Thank You!
- Excellent workshop, thank you.
- I just want to congratulate all of you for the constant and impeccable job and dedication to improve teacher's ability to use science ideas, kits and hands-on activities in class. Keep going please.
- Really enjoyed summer (as opposed to Saturday) as a time to learn.
- This was my first BAESI workshop and I have felt this was a great resource and use of my time. I hope to attend future workshops.
- I appreciate the time and effort that went into making each day effective, interesting and professional.

- Thank you.
- It was the most valuable workshop experience I've had by far! Thank you for all the work you put into this!
- It has been a wonderful experience. I want to thank Ellen, Richard and all helpers who made this workshop a huge success.
- Keep providing them! Thank you!
- More engagement, more projects, field trips weren't informative but it was nice to out of the classroom.
- I feel much more prepared to teach earth science after the workshop and motivated to include earth science topics in other curriculum too.
- Excellent workshop.
- Good activities and I appreciate the hard work and time.
- Very well done. Thank you.
- I enjoyed participating in this workshop. I'm more prepared to teach the concept of energy to my students.
- I truly enjoyed this week with you! I only wished it would have lasted another week.
- This is one of the best science workshops I've had.
- Thank you I have new info, new tools to use in my class and home. I really appreciate the website also.

Follow-up: Suggestions about content and/or format for follow-up workshops for 2008-2009.

- Rocks and Minerals and Elements and Results of Erosion.
- 1. Integration of topics on other subjects i.e. making the topics interdisciplinary (teams of teachers across curriculum areas could work together from same schools). 2. Elementary curriculum for science - the middle/high school teachers could help them with ideas.
- I will leave that up to the experts.
- Continuation of Climate Change and Peak Oil. Format the same it works.
- Maybe focus on-wind, solar, hydro, geothermal? The website will be a great resource!
- 1. What have you done (i.e. conservation etc.) with students since the week? 2. What lesson plans have you used that went well (share-out). 3. More time on climate change.
- Physical Science - Topics, Matter, Electricity, Weather and Topographic Mapping.
- 1. Could you still offer stipend? (help out teachers facing the budget cuts) 2. Topics: fossils: fun ways to teach minerals, rocks and fossils.
- Meteorology and climate.
- Too tired during school year.
- Ecology and plate tectonics.
- Content applications/activities that are immediately usable in the classroom.

- Yes a 90-minute lab at The Tech, Earthquakes the cost is \$250 for up to 30 teachers. I think most teachers would pay \$8 to \$9 for the experience if it can't be funded.
- 1. Earthquakes 2. More on natural resources 3. How to present earth science content to students in a way they can understand (i.e. dumbed down version of Richard's presentation) other than hands-on lab
- 1. Ask teachers to bring their best lessons, we have great ideas and I learned so much from my colleagues. 2. New lessons - many of us are already trained in Project Wet so are very familiar with lessons this week.
- 1. I would love to know more about basic grade 6 earth science, it would be helpful to include content for new teachers not familiar with content and learn about earth science. 2. It is possible to visit places and the peninsula?
- Same Format 1. I'm interested in seeing how France is handling its energy program with over 70% nuclear energy. 2. I am interested in Earthquake preparation as it has been updated.
- 1. Alternative fuels/energy sources 2. SETI 3. Mars Phoenix or other astrogeology topics 4. Santa Clara County/Bay Area geology past present future.
- Have a binder ready with material already in/ppts-on soft copy instead of hand copy (earth's resources).
- Maybe some labs on other topics.
- Similar to what was taught here: Plate Tectonics, Earthquakes and Ecology.
- To learn more about solar energy and ways to introduce the concept to students.
- 1. Earthquakes. 2. Alternative energy ideas.
- We need more time for grade level collaborations so we can plug this stuff in. I was hoping for a more complete unit to cover the resource standard that I've had trouble teaching. I have lots of great activities and wonderful new knowledge, but I'm not walking away with what I was hoping to have by Friday. Not a criticism just my expectation was different.

Activity Evaluations

A subset of the workshop activities were chosen for evaluation. Activities are not listed in any particular order. Participants were asked to evaluate six different activities in five areas: Planning, Educational Value, Arrangements, Quality of Presentation, and Contribution to Inquiry-based Science. Of the six activities, the highest number of responses came from the Energy Round-up Activity (with 33 respondents) and the lowest came from the Renew-a- Bean (with 28 respondents).

Activity #1: Energy Round-up Activity

Most teachers (97%) found the activity to be good or excellent. Teachers gave this activity a high average rating of 3.45 (good) out of 4.00 (excellent) for educational value. Also, over a third of teachers found the arrangements of this activity to be excellent. Over half rated the quality of the presentation to be good, and almost half responded that the activity contributed to their overall knowledge of science. A total of 33 respondents completed an evaluation.

Planning. In my opinion the activity was: (Mean rating= 3.39)		
Rating	Number	Percent
Needs improvement (1)	0	0%
Satisfactory (2)	1	3%
Good (3)	18	55%
Excellent (4)	14	42%
Total	33	100%

Educational Value. In my opinion the educational value of this activity could be described as: (Mean rating = 3.45)		
Rating	Number	Percent
Needs improvement (1)	0	0%
Satisfactory (2)	1	4%
Good (3)	16	48%
Excellent (4)	16	48%
Total	33	100%

Arrangements. In my opinion the physical arrangements for this activity were: (Mean rating = 3.21)		
Rating	Number	Percent
Needs improvement (1)	0	0%
Satisfactory (2)	4	12%
Good (3)	18	55%
Excellent (4)	11	33%
Total	33	100%

Quality of Presentation. In my opinion the quality of this presentation could be described as: (Mean rating = 3.27)		
Rating	Number	Percent
Needs improvement (1)	0	0%
Satisfactory (2)	1	3%
Good (3)	22	67%
Excellent (4)	10	30%
Total	33	100%

Contribution to Inquiry-based Science. I would describe this activity's ability to contribute to my overall knowledge of earth science as: (Mean rating = 3.24)		
Rating	Number	Percent
Needs improvement (1)	0	0%
Satisfactory (2)	5	16%
Good (3)	15	45%
Excellent (4)	13	39%
Total	33	100%

Participants' comments and suggestions of the activity are listed below.

Activity #1: Energy Round-up Activity

- I have needed this info on energy resources that has been, only briefly covered in my curriculum.
- Handouts would need to be modified for student use – depending on students it may be too much reading.
- Good literacy strategy; a little inquiry-based as well.
- Excellent for 6th graders; some modification maybe for reading material.
- Liked the jigsaw aspect, we need to find more appropriate reading level for students with limited English.
- I learned many new things about energy sources.
- Very useful and topical.
- Sixth graders would love this activity.
- Can be used as an inquiry-based activity or a review activity. Time would have to be adjusted for different ages.
- Also relating the diminishing total beans left after each “draw” to a percent for each renewable and nonrenewable is quite interesting. I truly enjoyed the range of options and opportunities to cross-reference topics!
- In a classroom, I would use a pie chart to quantify the current importance of each energy source.
- Can be done with any subject; not specific to science. We frequently do this type of teamwork in staff meetings.

- We need more information about the energy sources! More pros and cons of each energy source.
- It was great to learn about other energy.

Activity #2: Cookie Mining Activity

The Cookie Mining Activity received favorable ratings from teachers. Over 80% rated it as excellent in planning, educational value, and quality of presentation, while 79% rated it excellent in arrangements and contribution to inquiry-based science. Only one teacher rated it as satisfactory in contributing to their overall knowledge of science, and no one rated the activity as needing improvement. A total of 29 teachers completed an evaluation.

Planning. In my opinion the activity was: (Mean rating = 3.86)		
Rating	Number	Percent
Needs improvement (1)	0	0%
Satisfactory (2)	0	0%
Good (3)	4	14%
Excellent (4)	25	86%
Total	29	100%

Educational Value. In my opinion the educational value of this activity could be described as: (Mean rating = 3.83)		
Rating	Number	Percent
Needs improvement (1)	0	0%
Satisfactory (2)	0	0%
Good (3)	5	17%
Excellent (4)	24	83%
Total	29	100%

Arrangements. In my opinion the physical arrangements for this activity were: (Mean rating = 3.79)		
Rating	Number	Percent
Needs improvement (1)	0	0%
Satisfactory (2)	0	0%
Good (3)	6	21%
Excellent (4)	22	79%
Total	28	100%

Quality of Presentation. In my opinion the quality of this presentation could be described as: (Mean rating = 3.86)		
Rating	Number	Percent
Needs improvement (1)	0	0%
Satisfactory (2)	0	0%
Good (3)	4	14%
Excellent (4)	25	86%
Total	29	100%

Contribution to Inquiry-based Science. I would describe this activity's ability to contribute to my overall knowledge of earth science as: (Mean rating = 3.76)		
Rating	Number	Percent
Needs improvement (1)	0	0%
Satisfactory (2)	1	3%
Good (3)	5	17%
Excellent (4)	23	79%
Rating	29	100%

Participants' comments and suggestions of the activity are listed below.

Activity #2: Cookie Mining Activity

- Kids will enjoy
- I would change a couple of things – make reclamation harder by requiring purchase of a “tool” to do it.
- I really like how materials were allocated as “cost”!
- Love the activity; have done it with my class.
- I loved this activity!! Have students count squares before beginning mining.
- Excellent activity rocks/minerals. Integrates math and science.
- For reclamation, count boxes covered outside of circle after 5 minutes. Subtract those out, don't tell student until you do it, otherwise they'll push everything back into the original circle before the 5 minutes.
- Fun and delicious, will definitely use this next year.
- Nice work.
- Lots of fun! Very interesting.
- Have used this lesson and will use it again.
- I love the correlation of science and math and environmental social issues.
- Great activity
- Great activity, but potentially really messy.
- Very high interest, good math connection, economic.
- Rich content in both math and science. Excellent hands-on activity.

Activity #3: Renew-a-Bean Activity

Over 70% of teachers found the Renew-a-Bean Activity to be of excellent educational value. In addition, over 50% rated it as excellent in planning, quality of presentation, and contribution to inquiry-based science. Twenty-six of 28 respondents found the physical arrangements of the activity to be good or excellent. A total of 28 individuals completed an evaluation.

Planning. In my opinion the activity was: (Mean rating = 3.50)		
Rating	Number	Percent
Needs improvement (1)	0	0%
Satisfactory (2)	1	4%
Good (3)	12	43%
Excellent (4)	15	54%
Total	28	100%

Educational Value. In my opinion the educational value of this activity could be described as: (Mean rating = 3.64)		
Rating	Number	Percent
Needs improvement (1)	0	0%
Satisfactory (2)	2	8%
Good (3)	6	21%
Excellent (4)	20	71%
Total	28	100%

Arrangements. In my opinion the physical arrangements for this activity were: (Mean rating = 3.39)		
Rating	Number	Percent
Needs improvement (1)	0	0%
Satisfactory (2)	2	8%
Good (3)	13	46%
Excellent (4)	13	46%
Total	28	100%

Quality of Presentation. In my opinion the quality of this presentation could be described as: (Mean rating = 3.43)		
Rating	Number	Percent
Needs improvement (1)	0	0%
Satisfactory (2)	3	11%
Good (3)	10	36%
Excellent (4)	15	53%
Total	28	100%

Contribution to Inquiry-based Science. I would describe this activity's ability to contribute to my overall knowledge of earth science as: (Mean rating = 3.54)		
Rating	Number	Percent
Needs improvement (1)	0	0%
Satisfactory (2)	1	4%
Good (3)	11	39%
Excellent (4)	16	57%
Total	28	100%

Participants' comments and suggestions of the activity are listed below.

Activity #3: Renew-a-Bean Activity

- This activity might be a little too advanced for many of my 6th grade students to relate to and understand.
- Hands-on, visual, and extendable. User friendly.
- Rich potential for visualizing, energy use choices.
- This is an excellent visualization of consumption of energy over time. It includes the use of great science processing skills and variations for grade level.
- Excellent activity that will clearly demonstrate to my 6th grade students the energy problems facing the world.
- I really like this activity and plan to do it in my class. Definitely use this for the coming school year.
- Change the beans to be the same size, just different colors.
- Really brings home the point of renewable resources making energy use possibilities last much longer than use of non-reusable.
- This is a great activity to show the students the consequences of using non-renewable resources and benefits of using renewable resources.
- Beans should be the same size so it's easy to hit row and they all feel the same size among your fingers.
- Interesting, useful, cheap and combines math and science.
- This is very student and teacher friendly. Easy to implement and clear results.
- I like the extension for high school.
- I think that it would be great to tie in a local city that has been identified as a renewable city.
- It would have been beneficial to discuss the different scenarios people did. Great activity especially after the resource concept map.
- Would use items that were the same size so the students wouldn't be inclined to pull majority of the renewable items.
- Great hands-on activity. Perhaps more extension explanations on using the different variables.
- It would be good if the beans were all the same size – perhaps you could replace the beans with beads.
- Could integrate the use of Excel to have students doing graphing, averaging, and etc.

Activity #4: Solar Energy Kit Activity

Over three-fourths of the teachers rated the Solar Energy Kit Activity as excellent in planning, educational value, arrangements, and quality of presentation. Twenty-seven of 29 (93%) respondents found the activity to be good or excellent in contributing to their overall knowledge of science. A total of 29 individuals completed an evaluation.

Planning. In my opinion the activity was: (Mean rating = 3.79)		
Rating	Number	Percent
Needs improvement (1)	0	0%
Satisfactory (2)	0	0%
Good (3)	6	21%
Excellent (4)	23	79%
Total	29	100%

Educational Value. In my opinion the educational value of this activity could be described as: (Mean rating = 3.76)		
Rating	Number	Percent
Needs improvement (1)	0	0%
Satisfactory (2)	1	4%
Good (3)	5	17%
Excellent (4)	23	79%
Rating	29	100%

Arrangements. In my opinion the physical arrangements for this activity were: (Mean rating = 3.83)		
Rating	Number	Percent
Needs improvement (1)	0	0%
Satisfactory (2)	0	0%
Good (3)	5	17%
Excellent (4)	24	83%
Total	29	100%

Quality of Presentation. In my opinion the quality of this presentation could be described as: (Mean rating = 3.72)		
Rating	Number	Percent
Needs improvement (1)	0	0%
Satisfactory (2)	1	3%
Good (3)	6	21%
Excellent (4)	22	76%
Total	29	100%

Contribution to Inquiry-based Science. I would describe this activity's ability to contribute to my overall knowledge of earth science as: (Mean rating = 3.62)

Rating	Number	Percent
Needs improvement (1)	0	0%
Satisfactory (2)	2	7%
Good (3)	7	24%
Excellent (4)	20	69%
Rating	29	100%

Participants' comments and suggestions of the activity are listed below.

Activity #4: Solar Energy Kit Activity

- Will incorporate this into renewable energy for 6th grade this coming school year. There is also a Hydrogen-fuel cell can (\$60) per kit that I will be using with 5th grade after they split the water.
- Great, I loved the inquiry piece.
- Great, thank you for this.
- Hard copy of lesson plan?
- Lots of great ideas. Thanks!
- I might use this activity, depends on the cost. Thanks.
- Very cool and fun! Great resource.
- Thank you for the kit! The explanation of how they work is definitely above student level, but valuable for us.
- Thank you for the solar kit.
- Wow!
- Thank you for the solar fan! I loved assembling it. The ideas to use it in my classroom were awesome! Thank you again!
- Excellent concept and activity to use in many different ways in all grade levels.
- These are pretty expensive, which can inhibit this as a class activity.
- Impressive!
- I will definitely use this in my classroom!
- This little kit could be very useful in encouraging inquiry-based thinking. Kids could cycle through stations in pairs trying different variations on this and other alternative energy exhibits.
- I learned so much more doing this even though I have kits to use (which I haven't been able to use yet) this really gave me a push as to what to do with them.
- Especially timely to include after the doom and gloom oil bust.

Activity #5: What Do Concentrations Mean?

The Water Concentration Activity received positive ratings from teachers. Approximately 80% rated it excellent in planning and quality of presentation. Ninety percent rated it excellent in educational value. Over 20 of the participants rated it excellent in both physical arrangements and contributing to inquiry-based science. A total of 31 individuals completed an evaluation.

Planning. In my opinion the activity was: (Mean rating = 3.87)		
Rating	Number	Percent
Needs improvement (1)	0	0%
Satisfactory (2)	0	0%
Good (3)	4	13%
Excellent (4)	27	87%
Total	31	100%

Educational Value. In my opinion the educational value of this activity could be described as: (Mean rating = 3.90)		
Rating	Number	Percent
Needs improvement (1)	0	0%
Satisfactory (2)	0	0%
Good (3)	3	10%
Excellent (4)	27	90%
Total	30	100%

Arrangements. In my opinion the physical arrangements for this activity were: (Mean rating = 3.71)		
Rating	Number	Percent
Needs improvement (1)	0	0%
Satisfactory (2)	1	3%
Good (3)	7	23%
Excellent (4)	23	74%
Total	31	100%

Quality of Presentation. In my opinion the quality of this presentation could be described as: (Mean rating = 3.80)		
Rating	Number	Percent
Needs improvement (1)	0	0%
Satisfactory (2)	0	0%
Good (3)	6	20%
Excellent (4)	24	80%
Total	30	100%

Contribution to Inquiry-based Science. I would describe this activity's ability to contribute to my overall knowledge of earth science as: (Mean rating = 3.63)		
Rating	Number	Percent
Needs improvement (1)	0	0%
Satisfactory (2)	2	7%
Good (3)	7	23%
Excellent (4)	21	70%
Total	30	100%

Participants' comments and suggestions of the activity are listed below.

Activity #5: Water Concentration Activity

- I appreciate comments, for example extensions of the activity.
- This would be a good time to introduce the concept of concentration and its relationship to contamination.
- Great math connection.
- Would like to try it with different colors and compare (i.e., yellow and red).
- I think this has equal value as a math lesson.
- Fabulous math activity.
- Extend the table following #10 to include two new rows: base ten and %. Pre-teach "Concentration" Vocab and "Contaminants."
- Very good hands-on math/science activity!
- It was very straightforward to see the dilutions! The math was easy to do using the examples given. Thanks!
- Excellent link for teaching percentages and power of ten.
- Great for 6th grade math/science activity; easy to prepare and conduct; great results.
- I will do this activity with my students; very user friendly. Thanks!
- I love the use of everyday materials to teach such an abstract concept. Wonderful job!
- Great!
- I found it well developed, easy to do, love using the ice cube container.
- I would use this hands-on for 6th grade environmental unit!
- The teacher would need to further break down the concept of ppm and ppb in addition to the activity.
- Great activity, I've seen it before in a different variation. The comments from the participants were excellent.

Activity #6: Taste Test Activity

The Taste Test Activity received responses ranging from satisfactory to excellent in all five areas of the evaluation. Half of the teachers found the activity to be excellent in physical arrangements, presentation quality, and contributing to their overall knowledge of science. Over 40% of the participants found the planning and educational value of the activity to be excellent. A total of 30 teachers completed an evaluation.

Planning. In my opinion the activity was: (Mean rating = 3.37)		
Rating	Number	Percent
Needs improvement (1)	0	0%
Satisfactory (2)	2	7%
Good (3)	15	50%
Excellent (4)	13	43%
Total	30	100%

Educational Value. In my opinion the educational value of this activity could be described as: (Mean rating = 3.30)		
Rating	Number	Percent
Needs improvement (1)	0	0%
Satisfactory (2)	5	17%
Good (3)	11	37%
Excellent (4)	14	46%
Total	30	100%

Arrangements. In my opinion the physical arrangements for this activity were: (Mean rating = 3.47)		
Rating	Number	Percent
Needs improvement (1)	0	0%
Satisfactory (2)	1	3%
Good (3)	14	47%
Excellent (4)	15	50%
Total	30	100%

Quality of Presentation. In my opinion the quality of this presentation could be described as: (Mean rating = 3.47)		
Rating	Number	Percent
Needs improvement (1)	0	0%
Satisfactory (2)	1	3%
Good (3)	14	47%
Excellent (4)	15	50%
Total	30	100%

Contribution to Inquiry-based Science. I would describe this activity's ability to contribute to my overall knowledge of earth science as: (Mean rating = 3.30)		
Rating	Number	Percent
Needs improvement (1)	0	0%
Satisfactory (2)	6	20%
Good (3)	9	30%
Excellent (4)	15	50%
Total	30	100%

Participants' comments and suggestions of the activity are listed below.

Activity #6: Taste Test Activity

- Great chance to discuss merits of tap/bottled, filtered. Big anti-pollution campaign regarding plastic bottles was not really mentioned, this might be a time to do that.
- An inexpensive activity to use in my classroom.
- The subjectivity at this activity would make this activity difficult.
- Good activity to encourage students to use tap water rather than bottled water.
- Outstanding information regarding water to drink. Tap water saves the day!
- A good one for students to demonstrate how adversity can influence our decisions and thinking.
- May use this activity, thanks!
- Will definitely use.
- Interesting, but doesn't really teach anything. Might get people to stop buying bottled water, if only tap water didn't taste so bad.
- I wouldn't encourage students to drink.
- Nice work.
- Maybe use portion cups (you can get a lot at Costco or Smart and Final) to help with the taste from the paper cup.
- Fun activity, very engaging.
- Excellent! Students will majorly buy-in to this!
- Do the biocompostable cups come in a small size?; that might be a good alternative to the Dixie cups...
- I think the set up of stations was a bit awkward for getting the water samples. Also the taste of the cups was a problem for some. However it was a great activity!

Overall Evaluation of Summer Workshop Activities

More than half of the participants found the activities to be excellent in all of the five evaluation areas. Planning and educational value received the highest average ratings of 3.63 and 3.64, respectively. A total of 31 individuals completed an evaluation. Overall ratings of the six summer workshop activities are displayed in the table below.

Planning. In my opinion the activity was: (Mean rating = 3.63)		
Rating	Number	Percent
Needs improvement (1)	0	0%
Satisfactory (2)	1	2%
Good (3)	10	33%
Excellent (4)	20	65%
Total	31	100%

Educational Value. In my opinion the educational value of this activity could be described as: (Mean rating = 3.64)		
Rating	Number	Percent
Needs improvement (1)	0	0%
Satisfactory (2)	2	5%
Good (3)	8	26%
Excellent (4)	21	69%
Total	31	100%

Arrangements. In my opinion the physical arrangements for this activity were: (Mean rating = 3.56)		
Rating	Number	Percent
Needs improvement (1)	0	0%
Satisfactory (2)	1	5%
Good (3)	11	35%
Excellent (4)	18	60%
Total	30	100%

Quality of Presentation. In my opinion the quality of this presentation could be described as: (Mean rating = 3.59)		
Rating	Number	Percent
Needs improvement (1)	0	0%
Satisfactory (2)	1	4%
Good (3)	10	34%
Excellent (4)	19	62%
Total	30	100%

Contribution to Inquiry-based Science. I would describe this activity's ability to contribute to my overall knowledge of earth science as: (Mean rating = 3.51)

Rating	Number	Percent
Needs improvement (1)	0	0%
Satisfactory (2)	3	10%
Good (3)	9	30%
Excellent (4)	18	60%
Total	30	100%

Field Trip Evaluations

Field Trip #1: Santa Clara Valley Water District Field Trip

Ninety-seven percent of teachers rated the field trip planning as either good or excellent. Twenty-eight out of 30 (93%) described the field trip as good or excellent in educational value. Participants gave this field trip a high satisfactory rating for arrangements, presentation quality, and contribution to inquiry-based science. Only one participant rated the field trip as needing improvement in planning, arrangements, and quality of presentation. A total of 30 participants completed an evaluation.

Planning. In my opinion the activity was: (Mean rating = 3.07)		
Rating	Number	Percent
Needs improvement (1)	1	3%
Satisfactory (2)	0	0%
Good (3)	21	70%
Excellent (4)	8	27%
Total	30	100%

Educational Value. In my opinion the educational value of this activity could be described as: (Mean rating = 3.11)		
Rating	Number	Percent
Needs improvement (1)	0	0%
Satisfactory (2)	2	7%
Good (3)	13	43%
Excellent (4)	15	50%
Total	30	100%

Arrangements. In my opinion the physical arrangements for this activity were: (Mean rating = 2.81)		
Rating	Number	Percent
Needs improvement (1)	1	4%
Satisfactory (2)	7	23%
Good (3)	12	40%
Excellent (4)	10	33%
Total	30	100%

Quality of Presentation. In my opinion the quality of this presentation could be described as: (Mean rating = 2.81)		
Rating	Number	Percent
Needs improvement (1)	1	3%
Satisfactory (2)	2	7%
Good (3)	15	50%
Excellent (4)	12	40%
Total	30	100%

Contribution to Inquiry-based Science. I would describe this activity's ability to contribute to my overall knowledge of earth science as: (Mean rating = 2.92)		
Rating	Number	Percent
Needs improvement (1)	0	0%
Satisfactory (2)	7	23%
Good (3)	15	50%
Excellent (4)	8	27%
Total	30	100%

Participants' comments about the field trip are listed below.

Field Trip #1: Santa Clara Valley Water District Field Trip

- I wonder if the cost of fuel would be higher overall if we had a bus. Will you reimburse the carpool drivers? (I was a passenger and my driver refused to accept any money.)
- Although maps were provided, directions from Recycling (Green Team) to SCVWD would be very helpful for people who are not familiar with this area. To facilitate this, info can be given day before the trip.
- More time for Questions and Answers.
- I will definitely work to incorporate the drainage activity and do some form of a labyrinth experience.
- Although I live and teach just a stone's throw away from the SCVWD, I was totally unaware of what it had to offer! I really appreciated seeing what my family could do there. When my grandkids come to visit this summer, it will definitely be on our agenda. My husband and I will slightly extend our walks to take in what I saw there today. I also want to bring my science class there.
- Kathy is an amazing treat!
- Too much driving.
- Should just rent a bus for everyone.
- The second docent wasn't as knowledgeable about the equipment she showed us, this distracted me.
- I think it would be great for students. I knew a lot about water already.
- Instead of maps, perhaps turn by turn instructions could be distributed.
- Excellent!

- There were two presenters, one was excellent and the other good. Kathy's magic tricks were enchanting – great for students. Great place to take students and wonderful options for activities.
- Kathy was excellent!
- Trails could have been better marked.
- Thank you!
- I have seen most of this before in Project Wet so...
- Nicely timed field trip.

Field Trip #2: Tech Museum Field Trip

Over half of the teachers rated the field trip as excellent in all five areas of the evaluation. A total of 27 out of 30 (90%) teachers rated planning and educational value as either good or excellent. Likewise, over three-fourths of the teachers found the quality of the presentation to be either good or excellent. Seventy percent of teachers rated the arrangements as excellent. Only one teacher found the field trip to need improvement in educational value, quality of presentation, and contribution to inquiry-based science. A total of 30 teachers completed an evaluation.

Planning. In my opinion the activity was: (Mean rating = 3.08)		
Rating	Number	Percent
Needs improvement (1)	0	0%
Satisfactory (2)	3	10%
Good (3)	12	40%
Excellent (4)	15	50%
Total	30	100%

Educational Value. In my opinion the educational value of this activity could be described as: (Mean rating = 3.16)		
Rating	Number	Percent
Needs improvement (1)	1	3%
Satisfactory (2)	2	7%
Good (3)	8	27%
Excellent (4)	19	63%
Total	30	100%

Arrangements. In my opinion the physical arrangements for this activity were: (Mean rating = 2.84)		
Rating	Number	Percent
Needs improvement (1)	0	0%
Satisfactory (2)	2	7%
Good (3)	7	23%
Excellent (4)	21	70%
Total	30	100%

Quality of Presentation. In my opinion the quality of this presentation could be described as: (Mean rating = 2.84)		
Rating	Number	Percent
Needs improvement (1)	1	4%
Satisfactory (2)	3	10%
Good (3)	10	33%
Excellent (4)	16	53%
Total	30	100%

Contribution to Inquiry-based Science. I would describe this activity's ability to contribute to my overall knowledge of earth science as: (Mean rating = 2.96)

Rating	Number	Percent
Needs improvement (1)	1	3%
Satisfactory (2)	4	14%
Good (3)	6	21%
Excellent (4)	18	62%
Rating	29	100%

Participants' comments about the field trip are listed below.

Field Trip #2: Tech Museum Field Trip

- I've been there many times and this visit didn't provide anything different.
- Teachers' membership is great! Thank you!
- Would rate higher but anyone who has been here any length of time has been to the Tech a lot.
- A poll of pre-knowledge of the museum, a lot of us have been there before. It's a great resource, I didn't need the tour. But the energy exhibit was good.
- Opportunity for teachers to have a hands-on session there. Class of 30 or a quick peek at their five hands-on labs.
- I enjoyed exploring around.
- I would take my students there provided that there was curriculum for the students to work on.
- Being a Bay Area teacher, I have been to the Tech many times. While this was fun, it wasn't useful for me.
- I will bring my class to the Tech museum this next year as an extension of 6th grade science.
- I enjoyed hearing all the ways we could enhance field trips to the Tech Museum. For example, the way kids use their Tech cards in the classroom. Or, the way to use the kiosk to focus comments at the View the Earth exhibit. Thank you!
- Good source of information and hand-on activities.
- The planning seemed better on the BAESI side instead of on the Tech's side. She seemed to be presenting "off the cuff" and depending on us being late to complete her own preparation.
- Wish there was more time to explore the different exhibits. How would the IMAX movie connect with this workshop? Would it have useful to have seen?
- Good to get reacquainted with the Tech after a few years away.
- Fantastic – I have been to the Tech with students but didn't realize all the possibilities. We usually go every year – now I know some more focused educational activities to do which can be based on students' interests (so do some activities – others do others – or whatever they are interested in).

Field Trip #3: Green Team Recycle Center Field Trip

Over half of the respondents found the field trip to be good in planning, arrangements, and quality of presentation. Only two attendees (7%) found the arrangements to need improvement. Some teacher commented that masks would have been helpful to wear at the recycling center, and another wanted to have bus transportation to the field trip. Teachers were varied in their ratings of how the field trip contributed to their overall knowledge of science: ten teachers rated this field trip to be either satisfactory or good, while eight teachers rated it as excellent. A total of 30 individuals completed an evaluation.

Planning. In my opinion the activity was: (Mean rating = 3.08)

Rating	Number	Percent
Needs improvement (1)	0	0%
Satisfactory (2)	6	20%
Good (3)	17	57%
Excellent (4)	7	23%
Total	30	100%

Educational Value. In my opinion the educational value of this activity could be described as: (Mean rating = 3.16)

Rating	Number	Percent
Needs improvement (1)	0	0%
Satisfactory (2)	8	27%
Good (3)	12	40%
Excellent (4)	10	33%
Total	30	100%

Arrangements. In my opinion the physical arrangements for this activity were: (Mean rating = 2.83)

Rating	Number	Percent
Needs improvement (1)	2	7%
Satisfactory (2)	8	26%
Good (3)	15	50%
Excellent (4)	5	17%
Total	30	100%

Quality of Presentation. In my opinion the quality of this presentation could be described as: (Mean rating = 2.83)

Rating	Number	Percent
Needs improvement (1)	0	0%
Satisfactory (2)	10	33%
Good (3)	15	50%
Excellent (4)	5	17%
Total	30	100%

Contribution to Inquiry-based Science. I would describe this activity's ability to contribute to my overall knowledge of earth science as: (Mean rating = 2.96)		
Rating	Number	Percent
Needs improvement (1)	1	4%
Satisfactory (2)	10	34%
Good (3)	10	34%
Excellent (4)	8	28%
Total	29	100%

Participants' comments about the field trip are listed below.

Field Trip #3: Green Team Recycle Center Field Trip

- I would have benefited from an indoor review of the facilities and questions before the walk through. The guide needs a microphone or bullhorn.
- Needed more time for Questions and Answers. The representative from the recycling center seemed a little “green.”
- Prefer p.m. field trip.
- I am always looking for ways to talk about recycling and have never been to a plant. Great experience to pass on to students even if we don't go to a plant.
- An excellent real-world experience.
- Need to plan to have a bus for transportation.
- Why didn't the workers have face masks as the equipment drivers did?
- Would have liked a nose mask. Could have seen the same thing in a video, or have someone video camera the tour and show back in the classroom.
- Nice job.
- It was a great (though smelly) experience to see where all our recycled material goes to, and to learn more about what can/cannot be recycled.
- I would have liked more explanation of what happens to the recycled materials. What is made from the recycled materials?
- Thanks!
- It opened my eyes and I can see how it would change kids' perspectives. So very worthwhile but wish he had known more or showed us more about recycling.
- I couldn't hear any comments made in the sorting area. An improvement would be to visit, then discuss.
- How could I adapt that to my classroom?
- This would be an excellent trip for students; however I don't think we really experienced it the way they would have. A bit noisy and the tour guide couldn't be heard by everyone.
- Needed masks to protect us from dust and other stuff in the air.

Overall Evaluation of Summer Field Trips

Teachers found the three field trips to be good in planning, educational value, arrangements, quality, and contribution to inquiry-based science. Approximately half of the teachers (49%) rated the field trips as excellent in educational value. Perhaps the information on the field trips was familiar to teachers, because about a quarter (24%) rated the field trips as contributing to their overall knowledge of science as satisfactory. A total of 30 teachers completed an evaluation.

Planning. In my opinion the activity was: (Mean rating = 3.21)		
Rating	Number	Percent
Needs improvement (1)	0	1%
Satisfactory (2)	3	10%
Good (3)	17	56%
Excellent (4)	10	33%
Total	30	100%

Educational Value. In my opinion the educational value of this activity could be described as: (Mean rating = 3.33)		
Rating	Number	Percent
Needs improvement (1)	0	1%
Satisfactory (2)	4	13%
Good (3)	11	37%
Excellent (4)	15	49%
Total	30	100%

Arrangements. In my opinion the physical arrangements for this activity were: (Mean rating = 3.14)		
Rating	Number	Percent
Needs improvement (1)	1	3%
Satisfactory (2)	6	19%
Good (3)	11	38%
Excellent (4)	12	40%
Total	30	100%

Quality of Presentation. In my opinion the quality of this presentation could be described as: (Mean rating = 3.16)		
Rating	Number	Percent
Needs improvement (1)	1	2%
Satisfactory (2)	5	17%
Good (3)	13	44%
Excellent (4)	11	37%
Total	30	100%

Contribution to Inquiry-based Science. I would describe this activity's ability to contribute to my overall knowledge of earth science as: (Mean rating = 3.10)

Rating	Number	Percent
Needs improvement (1)	1	2%
Satisfactory (2)	7	24%
Good (3)	10	36%
Excellent (4)	11	38%
Total	29	100%

Speaker Evaluation, Speaker: Mary Morse

Mary Morse (City of San José Environmental Services) presented hands-on lessons from *South Bay Water Connections* - Environmental Education Classroom Activities for grades 6-8 and discussed the City of San Jose's environmental education programs.

Teachers highly rated the presentation by Mary Morse in all areas of the evaluation. Over half of the raters found the presentation to be excellent in planning, educational value, and contribution to inquiry-based science. In addition, 81% (25 out of 31) of the respondents rated the quality of Mary Morse's presentation as excellent. About half of the respondents described the physical arrangements of the activity as either good or excellent. A total of 31 teachers completed an evaluation.

Planning. In my opinion the activity was: (Mean rating = 3.77)		
Rating	Number	Percent
Needs improvement (1)	0	0%
Satisfactory (2)	0	0%
Good (3)	7	23%
Excellent (4)	24	77%
Total	31	100%

Educational Value. In my opinion the educational value of this activity could be described as: (Mean rating = 3.84)		
Rating	Number	Percent
Needs improvement (1)	0	0%
Satisfactory (2)	0	0%
Good (3)	5	16%
Excellent (4)	26	74%
Total	31	100%

Arrangements. In my opinion the physical arrangements for this activity were: (Mean rating = 3.39)		
Rating	Number	Percent
Needs improvement (1)	0	0%
Satisfactory (2)	2	7%
Good (3)	15	48%
Excellent (4)	14	45%
Total	31	100%

Quality of Presentation. In my opinion the quality of this presentation could be described as: (Mean rating = 3.81)

Rating	Number	Percent
Needs improvement (1)	0	0%
Satisfactory (2)	0	0%
Good (3)	6	19%
Excellent (4)	25	81%
Total	31	100%

Contribution to Inquiry-based Science. I would describe this activity's ability to contribute to my overall knowledge of earth science as: (Mean rating = 3.61)

Rating	Number	Percent
Needs improvement (1)	0	0%
Satisfactory (2)	1	3%
Good (3)	10	32%
Excellent (4)	20	65%
Total	31	100%

Computer Experience Evaluation, Computer Activity: Carbon Footprint

The workshop featured several online lessons, including calculation of an individual's impact on the planet based on lifestyle. The Carbon Footprint computer activity planning was described by many teachers as either good or excellent. The educational value and presentation of the activity were rated as being excellent. Moreover, the physical arrangements for this activity, the planning, and its contribution to inquiry-based science were described as good. A total of 31 individuals completed an evaluation.

Planning. In my opinion the activity was: (Mean rating = 3.42)		
Rating	Number	Percent
Needs improvement (1)	0	0%
Satisfactory (2)	4	13%
Good (3)	10	32%
Excellent (4)	17	55%
Total	31	100%

Educational Value. In my opinion the educational value of this activity could be described as: (Mean rating = 3.55)		
Rating	Number	Percent
Needs improvement (1)	0	0%
Satisfactory (2)	3	10%
Good (3)	8	26%
Excellent (4)	20	64%
Total	31	100%

Arrangements. In my opinion the physical arrangements for this activity were: (Mean rating = 3.29)		
Rating	Number	Percent
Needs improvement (1)	0	0%
Satisfactory (2)	6	20%
Good (3)	10	32%
Excellent (4)	15	48%
Total	31	100%

Quality of Presentation. In my opinion the quality of this presentation could be described as: (Mean rating = 3.45)		
Rating	Number	Percent
Needs improvement (1)	0	0%
Satisfactory (2)	4	13%
Good (3)	9	29%
Excellent (4)	18	58%
Total	31	100%

Contribution to Inquiry-based Science. I would describe this activity's ability to contribute to my overall knowledge of earth science as: (Mean rating = 3.26)

Rating	Number	Percent
Needs improvement (1)	1	4%
Satisfactory (2)	5	16%
Good (3)	10	32%
Excellent (4)	15	48%
Total	31	100%

Summary of 2008 Summer Workshop and Field Trip Evaluations

A total of 31 teachers participated in a weeklong summer institute on June 23 – 27, 2008. Teachers participated in a number of classroom activities, six of which were selected for evaluation, and three field trips. A typical workshop participant taught science or math to sixth and seventh grade students, and had an average of 137 students. Pre- and post-workshop surveys revealed that teachers increased their personal knowledge and efficacy for teaching the areas covered at the workshop series. Overall, workshop activities were rated to be high in planning and educational value, while field trips were rated slightly less highly, with half of the teachers rating field trips as excellent. Teachers also rated the presentation by Mary Morse and the computer activity to be good or excellent. Teachers commented that they enjoyed and learned from the summer institute, and would like to participate in more sessions.

APPENDIX: Workshop Schedule

**WORKSHOP SCHEDULE
BAY AREA EARTH SCIENCE INSITUTE WORKSHOP
CALIFORNIA'S RESOURCES**

**JUNE 23-27, 2008
9 am - 3:30 pm**

Monday

NATURAL RESOURCES AND ENERGY

What are Natural resources?

Energy - forms and uses

Activity: Go outside: Where are the natural resources? Think about manufactured materials that are made from natural resources. Classify what you observe (hydrocarbons, water, fauna and flora, minerals).

RENEWABLE AND NON-RENEWABLE RESOURCES

Activities

- ✓ *Renew-a-Bean* (from *Renewables are Ready*/Union of Concerned Scientists) - Beans with different colors are used to represent renewable and nonrenewable energy in a simulation where students use graphing and calculation of percentages to understand how, over time, nonrenewable resources will be depleted.
- ✓ *Energy Round-Up* (Project Learning Tree) - Student groups make presentations about different energy sources, discussing their uses and pros and cons from economic, social, and environmental perspectives.
- ✓ *Your State's Energy Scorecard* (<http://www.sciencenetlinks.com/Esheet.cfm?DocID=187>)

Tuesday

WATER

- **Sources, supply, and quality**
- Guest Speaker: Mary Morse, City of San José Environmental Services, Watershed Protection
- **Activities**
 - ✓ Water cycle game (Project Learning Tree)
 - ✓ *South Bay Water Connections* - Environmental Education Classroom Activities for grades 6-8 (City of San José)
 - ✓ California water Issues and maps
 - ✓ On-line activity: *Surf Your Watershed* (<http://cfpub.epa.gov/surf/locate/index.cfm>)
 - ✓ *What Do Concentrations Mean?* - Students explore how many dilutions of a pure substance (food coloring) are needed to produce a 1 part per million concentration.
 - ✓ *Grave Mistake* (Project Wet) Students analyze data and read stories to trace the flow of contaminated ground water.

Wednesday

SITE VISITS

GreenTeam recycling plant and the Santa Clara Valley Water District

MINERALS AND MINING

Activities:

- ✓ Useful rocks and minerals: ID with flowcharts
- ✓ *Chocolate Chip Cookie Mining* - Introduces students to the economics of mining as they buy their "property" (cookies), purchase the "mining equipment" (toothpicks and paper clips), pay for the "mining operation" (removing the chips), and finally pay for "reclamation." In return, the player receives money for the "ore" mined. The objective of the game is to make as much money as possible.

Thursday

GLOBAL CLIMATE CHANGE/PEAK OIL

Activities

- ✓ Climate concept maps
- ✓ *Effects of Climate Change on Living Things* (from Facing the Future; *Climate Change: Connections and Solutions*, Grades 6-8) - Students work in small groups to learn how climate change impacts living things in a variety of ecosystems and prepare skits to portray those impacts to the class.
- ✓ Online: personal carbon footprint (http://us.zerofootprintkids.com/kids_home.aspx)
- ✓ Should we drill ANWR?

Friday

SITE VISIT

The Tech Museum of Innovation
Green by Design and other exhibits; resources for teachers

GLOBAL CLIMATE CHANGE/PEAK OIL (CONT.)

SOLAR ENERGY

Inquiry activities with solar cell kits assembled by participants.

EVALUATION