

To Tour
75 fourth graders from Hamilton Elementary School, PUSD
February 9, 2012, 2 hours

Teachers: Carmela Calderon, Nicole Anderson, Christine Reischling

Room parent contact: Jennifer McCreight

Volunteers: Nina Lin, Ajay Limaye, Jule Jiang, Danielle Sumy

No Seismo Lab tour, so first had introduction and welcome in Sharp lecture hall, then rotated among four stations:

First stop: Welcome to Caltech! - Laurie Kovalenko

Second stop: Rocks and Minerals - Nina Lin

Third stop: Rocks and Minerals on the: The Story of Landscapes - Ajay Limaye

Fourth stop: Earthquakes - Junle Jiang

Fifth stop: Out to Sea - Danielle Sumy

Ajay: My topic was "Rocks and Minerals on the Move: The Story of Landscapes." We started by looking at a picture of an evolving sand dune and ripples: we made observations, formed hypotheses about what was going on, and brainstormed lab experiments we could use to test our ideas. This was a great way, with one picture, to frame our discussion of the scientific method and how we apply it to explore Earth's evolving surface. The students got most excited when I asked open-ended questions, such as "where was this picture taken?" or "where did this handful of sand come from"? The discussions that followed these kinds of questions kept the students much more engaged than when I spoke for minutes on end. Overall, I'd recommend whittling down your material as much as possible so you're free to use the students' questions and answers to shape the discussion.

Danielle: I presented photos and movies of research cruises that I participated with, and earthquake research that is done at sea. My dissertation research was based on ocean bottom seismometer data, so I presented many first-hand pictures and accounts of what it is like to travel and be without the comforts of home for sometimes months at a time. Also, since 4th grade earth science is based on rocks and minerals, at the end of my presentation, I showed basalts that had been dredged after the 9o50'N East Pacific Rise eruption in 2006, and had them compare and contrast the rock with a granite. I really enjoyed talking with the 4th graders, and at this age, they are full of questions and wonder. Much of my presentation was mainly a Q&A session, and I let them ask many questions! I think for this age group, it is important to just be very excited about your research, and make sure that your enthusiasm translates across to your audience. I did have one group (out of the four), however, that did not seem to be engaged in my presentation, so for next time, I would really like to become better at reading my audience and adapting to their dynamic.

Junle: I thought it would be interesting and useful to focus on earthquakes in California in my presentation, especially considering that this time TO tour doesn't accompany Seismo Lab tour. I organized my presentation as the following:

1. Self-introduction; what do scientists/grad students do; several reasons for why I like earth sciences;
2. Earthquake in California, Q&A. Throwing some questions, good for interaction:
Have you heard of San Andreas Fault? How often earthquakes occur in California?
How many have you experienced?
3. Earthquake machine (hands-on experiments): What components are in the machine? what of its feature is analogous to earthquakes? How different "earthquakes" occur? Why earthquakes are difficult to predict?
4. "The Big One" Magnitude 7.8 earthquake possibly to happen in southern California. Movie for SoCal ShakeOut Simulation;
5. Preparation from us: building code (what engineer can help); studying the behavior of faults and ground shaking (what scientist can help); earthquake early warning system (on-going research at Caltech!);
6. Preparation from everyone: emergency kit; ShakeOut Drill.

Compared to the 6th graders from San Marino High the last time I lead the tour, 4th-grade children are very enthusiastic and curious, and also don't know too much of earthquakes and tectonics. So I should be better prepared for questions at all levels and alter the presentation accordingly the next time.

In retrospect, I think the timing of my presentation is not well controlled as I hoped. The earthquake machine experiments consume quite some time and children participated actively, and therefore sending them back to seats for the later part of presentation might not be a wise strategy. I should have placed this hands-on activity in the end so that they can have the most fun toward the end and besides time control could be more flexible.

Nina: Rocks and Minerals (for 4th graders)

Lectures and Demonstrations

The key points of these activities are as follows:

Why do we care about rocks and minerals?

-- the kids need to think about this questions by themselves

How do we distinguish the three major types of rocks (igneous, metamorphic, sedimentary)?

-- demonstrate rock samples (samples are from Brian Wernicke)

-- use very simple characteristic features to distinguish these three types of rocks

Where do you find these different types of rocks in California?

-- talk about basic geography of California

-- point out major distributions of different rocks by using large geologic domains (Sierra Nevada, Coastal Range, etc)

Hands On: Create your own collections

Materials needed:

-- stone samples of 3 fundamental types, paper board (cut into ~ 6.5" x 6.5" size each), glue guns, pens, hand lens

Sources of Samples:

-- BLC Lincoln Tile & Stone for granite;

-- La Canada Rustic Stone for sandstone and schist flagstones

Preparation for samples: consult Mark Garcia

Notice: 1-2 helpers are needed for operating the glue guns