

Hamilton 4th graders
March 7, 2013
80 students, divided into four groups
From 10 AM until noon
Nina Lin, Kirsten Siebach, Laurie Kovalenko

Nina Lin "Rock and Minerals"

Gave 25 minute presentation, four times, to groups of 20 4th graders
Helpers (glue gun operators): Renata Cummins, Jen Hamon, Chris Rollins, Christophe von Hagke, Ajay Limaye, Marion Thomas, James Maloney)
This is the second time that we hold this "Rocks and Minerals" at TO for 4th graders. The activity itself is quite simple: I talk about the three basic rock types, how they look like (with sample demonstrations), and where to find them in California, and end the activity with the hands-on "Create your own rock samples". The demonstration works better this time because I borrowed the video camera and the camera rack from the division (stored at Sharp Lecture Hall). The complicated part lies in the preparation of the rock samples. Laurie had to purchase the flagstones for sandstone and schist samples and collect granite tiles donated from a tile company, and then Mark helped chop them into small pieces. Laurie also had to cut the paper boards for the kids to put the rock samples on. Another difficult part is manpower. For each 30-min session there needs to be at least two extra people to help with the gluing. This time we have several new outreach participants taking care of this, and that worked out pretty well, as the kids got a chance to ask the scientists more questions when doing the gluing. This event is certainly a lot of fun with great interaction, but just the preparation itself and the manpower issue could be difficult.

Kirsten Siebach – "Why Earth is Special"

Gave 50-minute presentation twice, to groups of ~40 fourth graders at a time

Since these students were fairly young, I decided to cover a few topics without going into as much depth as usual, and include fun video clips. I talked about why Earth was special in comparison with other planets (mostly Mars) with emphasis on three points: (1) Earth has all three phases of water, (2) Earth has plate tectonics (3) Earth's atmosphere is just right for life. I used video clips from NASA for Curiosity's landing and from the BBC documentary "Power of the Planet: Volcanoes" for the formation of the planet and plate tectonics. The kids were smart and had SO MANY questions. I think there were at least 3 hands raised the entire time I was talking, and a few times it approached 20 hands in the air. The first time I tried to answer questions as they came up, but there were too many, so the next time I said I would stop every couple of slides for ~3 questions. That worked better. One of the things I learned was to ask the teacher/chaperones to help me identify children who I had not called on yet, because it was hard to keep track with so many hands in the air. That worked much better. I think they got a good little overview and came away with some new ideas. This group mostly didn't know plate tectonics, and I'm sure it will take a few more lessons before they understand it all, but it was fun to give an

introduction to the subject and their questions indicated that they were learning and understanding. Fun group!

Laurie Kovalenko - "Shocking Science: Static Electricity" (topic requested by teacher)

Gave four half-hour presentations to groups of about 20 fourth graders

Since there were no classrooms available, we were in Sharp Lecture hall. It worked out okay with the students sitting in the front.

We started with examples of static electricity, and I gave a demo of a Van de Graaff generator, borrowed from Physics (Jeff Cady), in which we "created lightening." Then we did some simple demonstrations with balloons and styrofoam plates that they could do at home. Volunteers from the audience came up to see which of these rubbed items attracted or repelled each other. We then developed the concept of charge, positive and negative.

Then we discussed different types of materials, conductors and insulators, and they all call came up, half the class at a time, to act out being either a conductor or an insulator (they each took a piece of cardboard labeled either "+" or "-", paired up into atoms in the material, and then responded to the presence of a large charge. Next time I would control this a bit more, like saying "nucleuses, hold up your charge; can you move? No! Now electrons, hold up your charge. Can you move? Yes if conductor, no, but sort of, if insulator. Go ahead!). Then we saw some animations of conductors and insulators.

We used the Van de Graaff generator again, this time with a rabbit pelt (I used the term "hide" since they learn that in 4th grade when studying the settlers) and with a stack of aluminum cupcake tins. These were great demos.

Then we went over how the Van de Graaff generator works, and the origin of lightning.

We ended with a demo of Lenz's Law. We used a plastic tube and a copper tube with small but powerful magnets, and students first predicted what would happen if they dropped a magnet down the tubes before coming up and doing the experiment. We then used the combined-glass-and-metal tube borrowed from Physics along with an ultra-powerful magnet (dangerous if you get two stuck together with your finger caught in between, I now know from experience!). We used only one magnet. Again the students predicted what would happen if you dropped a magnet down the tube, and then they performed the experiment. These demos showed the combination of electricity and magnetism, as well as tying in the two types of material, conductors and insulators.