January 14th 2011
Erin Burkett, visit to give Earthquake demos
6th grade at McKinley (two of Dana Hill's earth sciences classes, one at a time, ~40 kids each)

Three Earthquake lesson demonstrations:

(1) Earthquake machine (borrowed from Laurie/TO) demonstration (see http://earthquake.usgs.gov/research/modeling/earthquakemachine.php#model_Description), letting the kids do the cranking and recording on the board the number of cranks or clicks and the distance the brick moved. The kids got really into the earthquake machine and the one class was great and eager about coming up with different ideas to try to see what the 'earthquake' would be like (wanting to try the smaller brick, add the smaller brick, flip it over on the different non-sandpaper side....before I even got to suggesting those). It was great because sometimes they had theories that they justified wrongly and then they could be corrected by the outcome and/or my followup clarifications on the relationships between friction, weight/pressure on the surface, and the stress buildup from the crank.

(2) Building shaking (resonant frequency) demonstration (see http://www.iris.edu/hq/programs/education_and_outreach/videos#N). Divided kids into groups of 5-6 and instructed them to make their own spaghetti-raisin city (spaghetti noodles of different heights stuck in a styrofoam base, with raisins on top of each piece of spaghetti)…recommended to the kids to have at least one full-length spaghetti, and not too many short ones. Some kids got creative and started connecting noodles horizontally with raisins to have more complicated structures to resist swaying! Then I went around and demonstrated shaking at different frequencies that hit different height building resonant frequencies, to show that any building could potentially be at risk depending on the frequency of shaking.

(3) P-wave vs S-wave demonstration. Had kids make two lines shoulder-to-shoulder. To represent a P-wave ('Primary' wave because it's faster/arrives first, compressional wave), a kid starting at one end started a bit of a shove to his neighbor, which propagated down the line (may not want to do this if a group is too rowdy!), as long as you make sure the kids don't 'anticipate' the wave and move before it gets to them. For the S-wave, the kids hold hands (or wrists if they're at an age they think it's weird to hold hands), and the wave starts by pulling your neighbor's hand downward (and you can stand up again once you've been pulled down and the wave passes). With enough kids, it's fun to have two lines 'race' and show that the P-wave travels along faster (a push gets transferred faster) than the S-wave.

Random questions that stuck out in my mind:
- Is there going to be an earthquake on MLK day?
- How do animals know when earthquakes are coming? (Since they seemed to think all animals know far in advance, I clarified that they don't all necessarily know, or for all earthquakes, and it may only be a few seconds/minute before the earthquake, most likely because they are more sensitive to earlier/different frequency vibrations we may not feel)
- Can earthquakes cause volcanos to erupt?