Notes from two lunchtime workshops with Caltech Classroom Connection
- about how to present science to kids

Workshop #1
December 4, 2008
CCC team: James Maloney, Jen Franck, Tara Gomez
Participants: Nina Lin, Willy Amidon, Alan Chapman, Steve Kidder

Connect with the kids – you were a kid once!
  • Introduce yourself, ask them their name
  • Say what you do, ask them what grade they are in

What are your goals?
  • Show what scientists do
  • Show that science is accessible to everyone
  • Inspire kids to learn more science
  • Have fun!

Engage the kids
  • Have hands on activities, such as
    o Drawing on balloons – for stress and strain
    o Triangulation exercise – for locating earthquakes
    o Cutting clay pictures – for faults
    o Sheets covered in dots – for how big is a million
    o Slinky – for s and p waves
    o Different kinds of rocks – metamorphic

Ask questions, such as
  • What do you notice about ...
  • Why is there a mountain?
  • Why does this rock look like this?

Use analogies, such as
  • Liquefaction is like your feet in the sand at the beach
  • Locating the distance of and earthquake with S and P waves is like locating
    the distance of lightening using the time difference between seeing the
    lightening and hearing the thunder

Also, have free goodies
  • Pens, stickers, hats, geology kits

And please include:
  • Caltech’s Tectonics Observatory
  • TO website: http://tectonics.caltech.edu/outreach
  • Thanks to Henry and Betty Moore Foundation
Afterwards, evaluate how it went:
  • Look at their body language. Did they smile? Did they ask questions? Were they happy?

Workshop #2
May 12, 2009
CCC team: James Maloney, Tara Gomez
Participants: Willy Amidon, Steve Kidder, Nina Lin, Anthony Sladen, Aron Meltzner

General strategies:
  • Learn through experience.
  • Define your learning objectives. Then pick activities that best help do this.
  • Different types of learning: visual, kinesthetic …
  • Use probing questions
  • Use scientific method – ask what they expect to see, write answers on the board, do the experiment, compare with predictions
  • Have something that they can take home – rock collection, magnifiers
  • Teach something cool about science, and how this is important to everyone, even those who will not be scientists.
  • Can point out science is teamwork (some go in field, some do calculations, some do lab experiments), international.

Classroom visit:
  • Give email to teacher for follow-up questions.

Eaton Canyon:
  • Make sure there are at least 2 adults for each group
  • Have patience!
  • Give high energy students extra jobs
  • Have eye contact with each kid so they feel connected as well as stay in line
  • Don’t always lead like a mother duck; be inside the group as well
  • No ipods
  • Could say, at the beginning, “What do you expect to see?” Write this down. Then at end of hike can review.
  • Things to discuss:
    o Faults, rock types, weathering, patterns, waterfall
  • Have activities ready for during breaks.
  • Some activities:
    o Work sheet with names of things to find, or with actual photos (can work in teams, and can get prize)
    o Count the number of times you see something, such as a certain type of rock.
    o During lunch break, could sketch something
o Use notebook for observations, reflections, diagrams, questions.
  ▪ See: sciencenotebooks.org
o Maybe have a few vocabulary words in mind. Then:
  ▪ What do you see?
  ▪ Geologists call this ….;
  ▪ Write in notebook “A fault is ….’Brien
o What are the important features? Draw them.
  • One strategy: Talk about something. Then ask “What do you see over there?”

Science Fair:
  • Nina’s idea for outreach activities that have K-6th grade: make their own rock collection.

TO Tours:
  • As you meet the students, welcome them to Caltech and to your lab.
   o Introduce yourself. Let them know where you are from. Ask them if they know what a graduate student / postdoc is. Tell them where you went to undergrad school.
   o Let them know how you became interested in science; why you are working in science
   o Let them know what else you like to do besides science – what are your hobbies?
  • Discuss and show your cutting edge science
  • Tell them one question you are trying to answer, such as
    o An experiment you are trying to perform
    o A scientific claim you are trying to make and HOW you know it is true
    o A tool you use in your research (e.g., glove box, mass spec, computer…)
    o The broader implications of your work
    o Highlight that experiments fail
    o Mention where your funding comes from
  • Check to see that students are engaged by asking them questions all along, such as
    o Can anyone tell me about …