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Visit to introduce overview of Plate Tectonics to 6th grade at McKinley (two of Dana Hill's earth sciences classes, one at a time, ~40 kids each)

Modified a presentation found on TO outreach site:

http://www.iris.edu/hq/programs/education_and_outreach/videos#B

...with some added in animations for plate tectonics (continental drift, seafloor spreading, and India-Asia collision) from

<http://www.tectonics.caltech.edu/outreach/animations/index.html>

Each kid also had a topo/bathymetric world map printout on which to identify continents, oceans, plate boundaries, trenches, and ridges/rises.

I asked plenty of questions of the kids before and during the powerpoint slides, taking time to first ask what they already understood, point out or correct concepts/terminology, ask them to repeat it back (or ask questions that required them to use the new terms), and then either pause to have them locate relevant features on their maps (eg., mark with colored pencils/markers the trenches and ridges as the concepts of those came up). Example of questions to start out and then accompany the slides:

- How do you guys describe or think of what plate tectonics is?
- What drives plate tectonics? You can get a hint from up on the screen/slide (slide 1)...says cooling of earth, or convection...
- What is an example of convection at home? Boiling pot.... So what causes it to convect?Heat!
- So, in the simplest terms, plate tectonics is driven by the HEAT coming out of the earth by convection...

-...discuss what the plates are....(Slides 2 & 3). Getting a sense of the scale of the plates: Do you guys know how thick a tectonic plate ('lithosphere') is? ...~100 km, that is a bit more than 60 miles. How far is that to you guys? Do you know somewhere that's 60 miles from here (maybe an hour of driving on the highway)? That's how thick the plates are!

- Types of plate boundaries: convergent (subduction), divergent (ridges), transformuse hands to expression motions...(Slide 4)
- Convergent/subduction zones have trenches (Slide 5)....can see on maps (their handouts) where deepest parts are (have them highlight trenches....deepest blues of bathymetry, and labeled as 'trenches')

-Divergent spreading ridges (still Slide 5)....can see on maps as zigzag zones, labeled as 'rise' or 'ridge' in oceans...(mark on maps)

-Transform boundary....harder to see on Slide 5 (maybe change to san andreas example?), but at least ask where they know a close example....San Andreas Fault!

Mark where that is (where we are!...I was surprised how few 6th graders even really had a sense of where we're located on a world map!)

-show slide of plate boundaries (Slide 6).....should be similar to the lines they've started to highlight and map out on their maps!

-note earthquakes tend to happen along these boundaries (slide showing EQs, Slide 7 & 8)....deepest and largest at convergent subduction zones

-note volcanoes also are along SZs (Slide 9)

-The plates move at rates similar to the rate that your fingernails grow (Slide 10)! So we can't feel them moving, but over long periods of time they can move large distances...

-Plate tectonic motions.....Movies!:

--continental drift movie (Slide 11)... Play a number of times, point out india (fast grey...plows into asia)

--ocean spreading movie (Slide 12)...explain that the ridges spreading in the ocean is what is allowing the continents to drift around as in the previous movie

--show example cross-section of india colliding with asia (Slide 13)....see how the subduction looks from the side, and mountain building due to continental collision (point out that Mount Everest, one of highest mountains, is in this collisional region!)

-At the end, each group of 4 kids had to come up with at least 3 things they had learned and then pick one to present out loud to list on the board.