Crustal Activity

What are plate tectonics and how do they affect Earth?
Crustal Activity

- **Plate Tectonics** - the study of the formation and movements of plates
- **Plates** - section of the lithosphere that moves around
- **Lithosphere** - Earth’s solid outer crust
- **Asthenosphere** - partially melted layer that flows slowly and is located below the lithosphere
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- Earth’s surface consists of a dozen major plates and some minor ones
- The plates are moving at rates close to 10 cm/year
The Major Tectonic Plates
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• Convection Currents - driving force of plate movement
  • Magma heats up causing it to expand and rise
  • Magma cools down causing it to contract and sink
• The solid lithosphere is moving on top of the partially melted asthenosphere due to density differences
Convection Currents
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• The idea of continental drift had been around since the early 1900’s, but lacked enough scientific evidence to support the theory

• New advancements after World War II help provide the evidences needed to validate the Theory of Plate Tectonics
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• Evidence of Plate Tectonics

1. Earthquakes - when scientists plotted the locations of earthquakes they realized that they do not occur at random location, but run along isolated belts outlining the plate boundaries
2017 Earthquake Locations
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• Evidence of Plate Tectonics [continued]

2. Volcanic Evidences - occurs at plate boundaries where plates are interacting
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- Ring of Fire - isolated belt around the Pacific Ocean where 90% of the world’s volcanoes exist
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• Evidence of Plate Tectonics [continued]

4. Rock Evidence - horizontally deposited rock layers sometimes tilt and fold when plates interact
Tilted Rock Layers
Folded Rock Layers
Folded Rock Layers
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• Evidence of Plate Tectonics [continued]

5. Mountain Evidence - as plates collide they sometimes are pushed upward or downward
Himalayan Mountain Formation
Crustal Activity

- Evidence of Plate Tectonics [continued]

6. Fossil Evidence - fossilized shallow marine organisms can be found at high elevations in rock layers
Mount Diablo, CA