

Crustal Deformation

Reading: Chapter 10
Pages 283-304

Review Questions 4, 6, 7, 10, 12,
15, 18, 20

FINAL EXAM

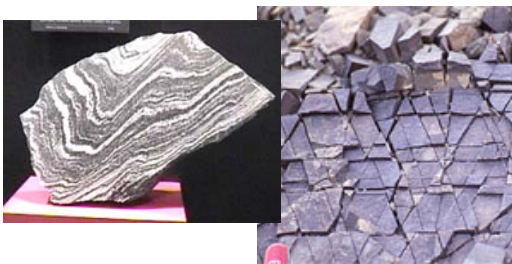
- NOON TO 2 PM, TUESDAY DEC. 5
- HERE: Natural Science 101
- BRING A SCAN TRON
- TURN IN YOUR REVIEW QUESTIONS BEFORE THE TEST, PICK UP WHEN YOU ARE DONE WITH THE TEST
- IF YOU WANT YOUR RESULTS, E-MAIL ME AND REQUEST YOUR GRADE

Plate Tectonic Settings and Magma

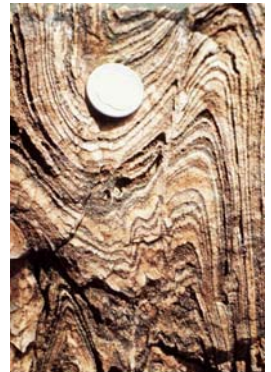
- The type of magma generated in different plate tectonic settings is different
- **DIVERGENT PLATES** and **MANTLE PLUMES** produce magma by partial melting of mantle material due to pressure release
- This magma is **BASALTIC** (mafic) in chemical composition, and the resulting volcanism has distinct characteristics.

Plate Tectonic Settings and Magma

- Where plates **CONVERGE**, water is driven off the subducting plate, and added to the overlying lithosphere
- This water acts as a **FLUX** to reduce the melting temperature, and cause hot solid rock to melt without a change in temperature
- The lithosphere here is continental (granitic) in character, and the magma generated is **GRANITIC** (felsic) in chemical composition.

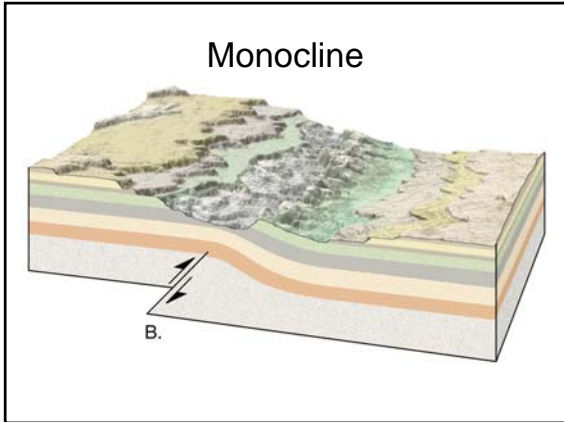
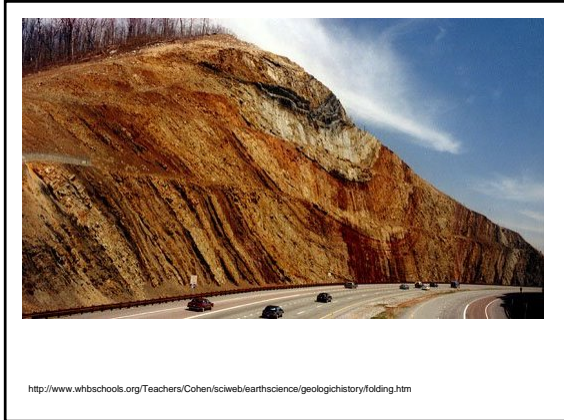
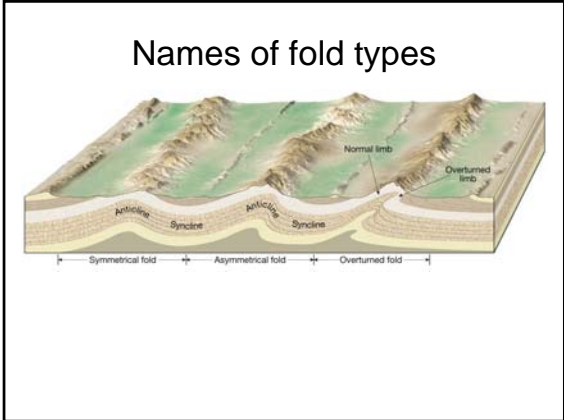


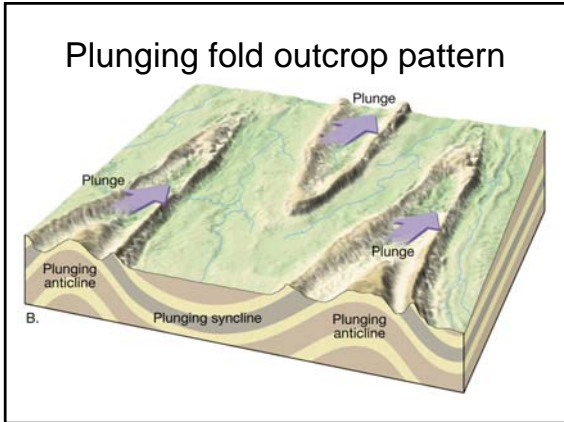
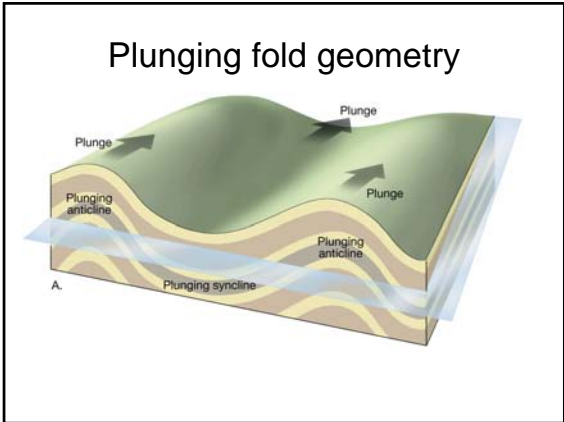
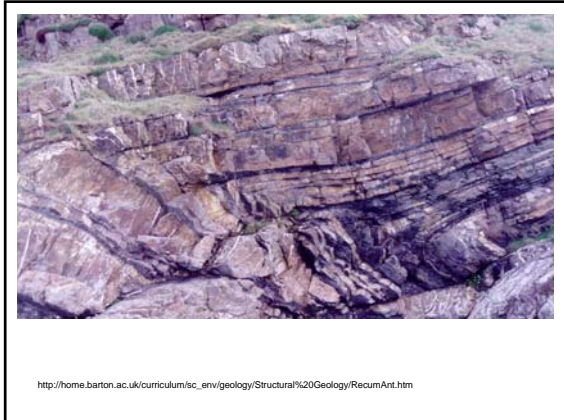
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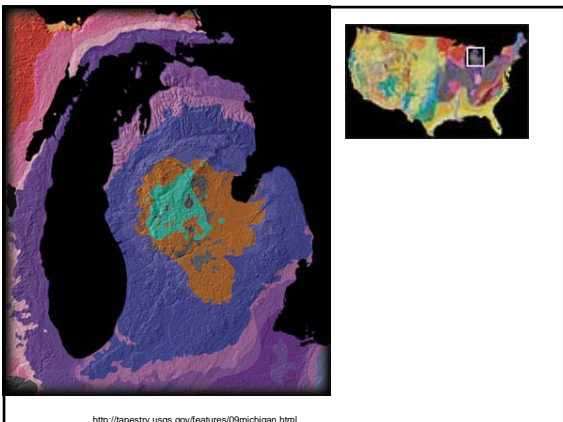
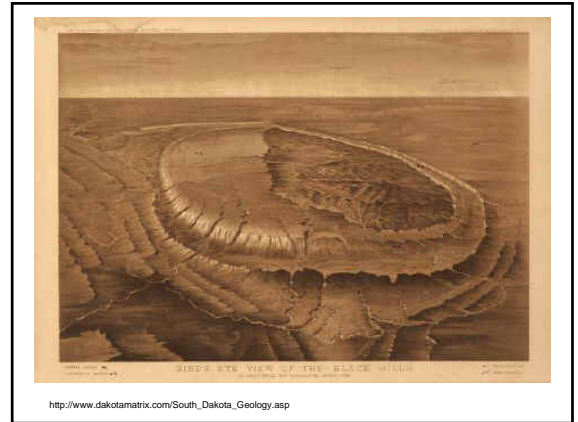
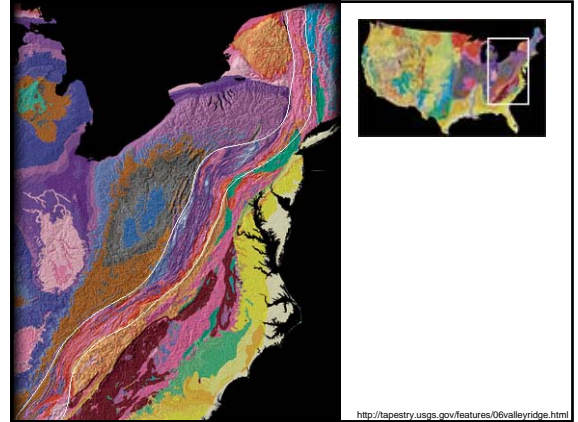
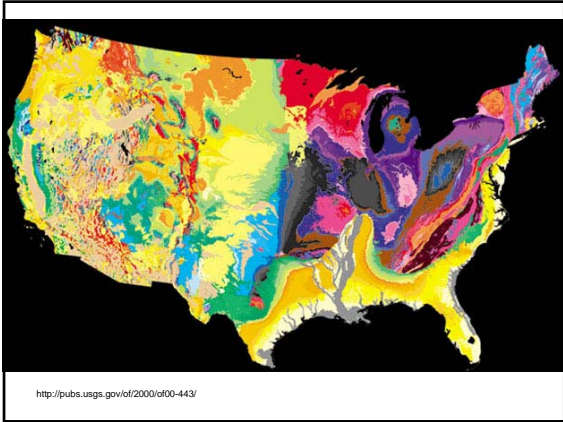


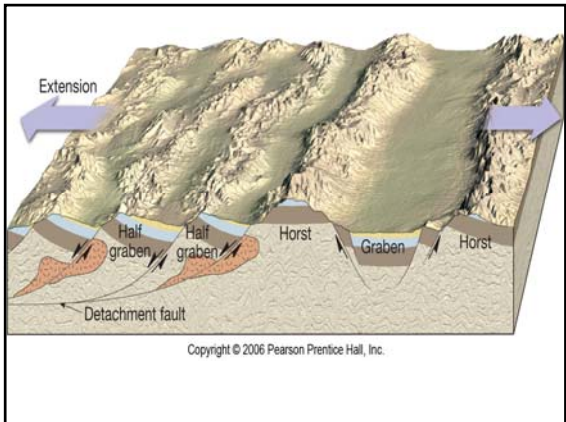
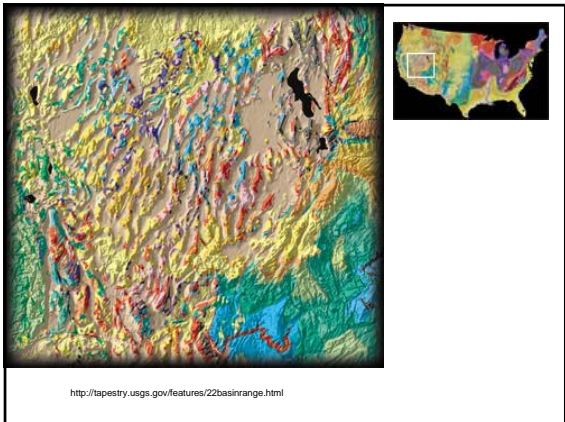
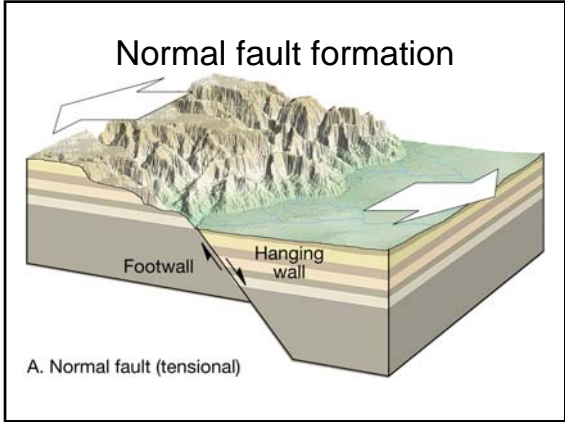
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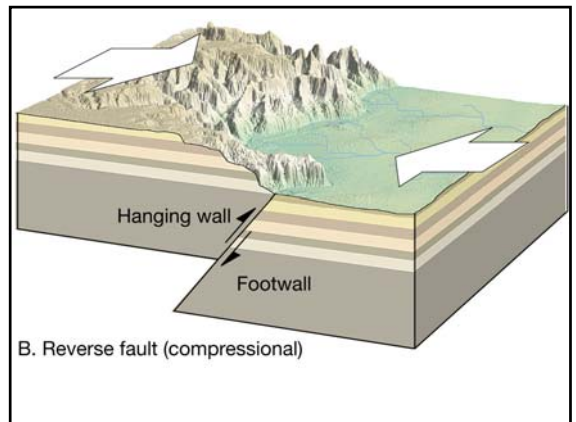
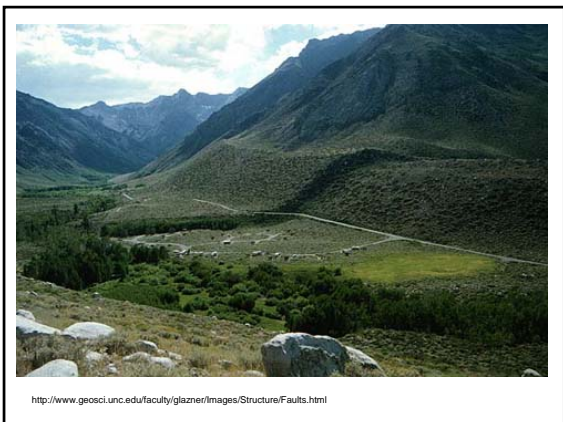
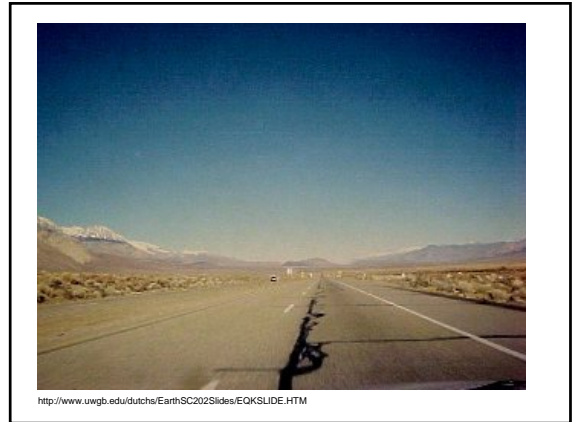
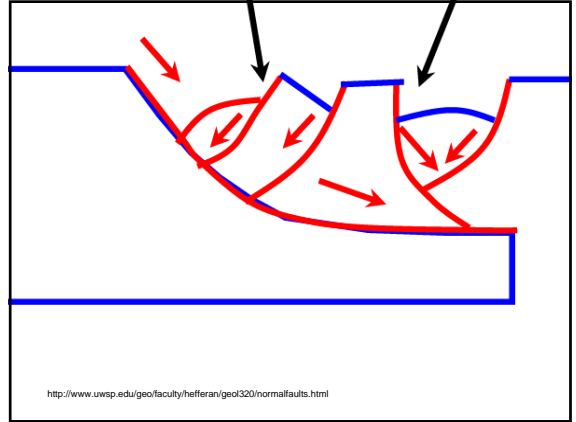
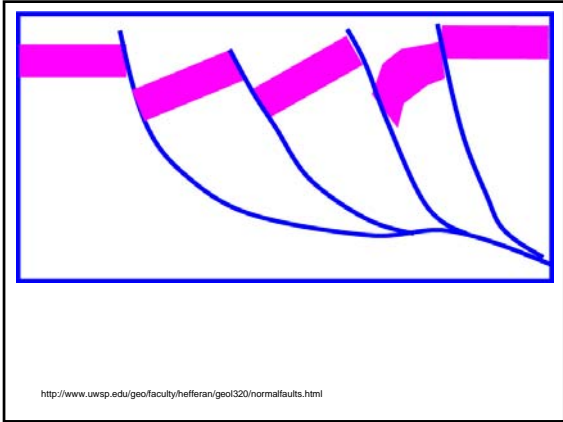
Inclined 10° folds in Quartzite of Mesa Mountains,
Riverside County, California.
Photo by Warren R. Hamilton USGS

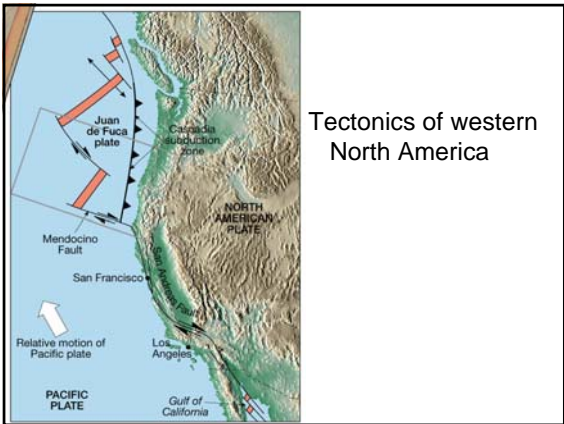
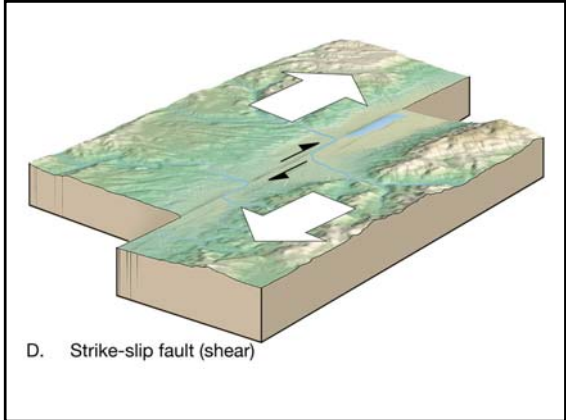
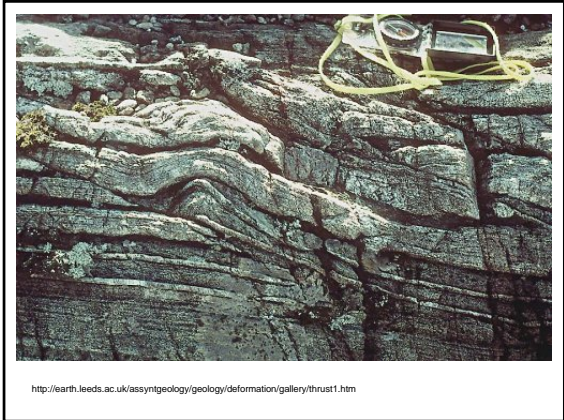
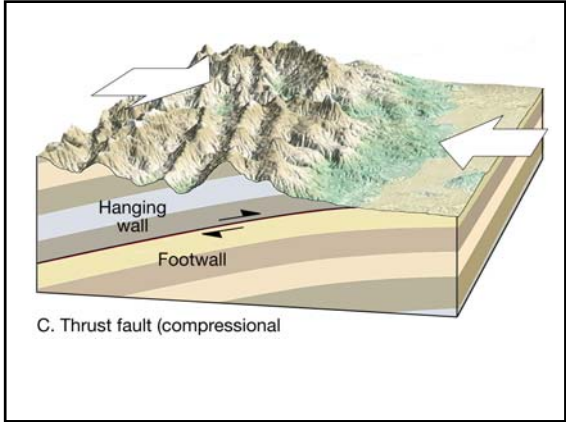
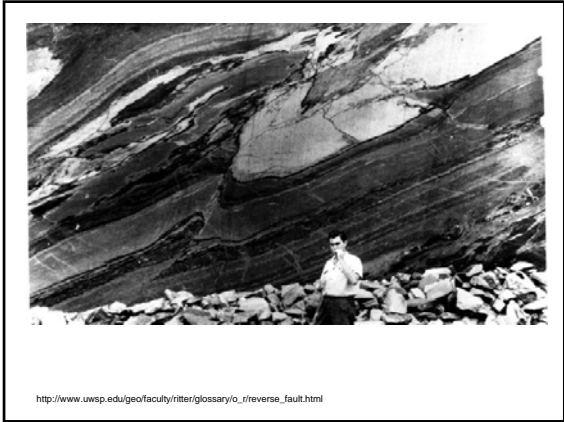


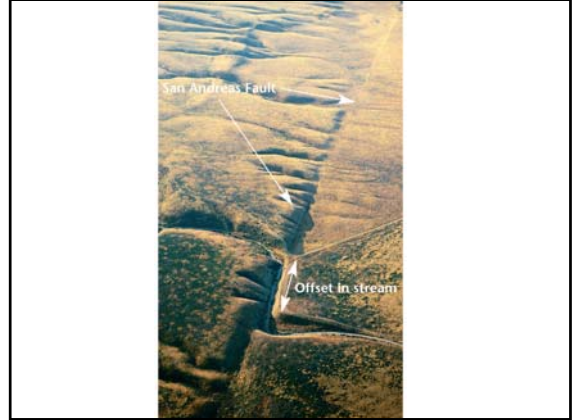








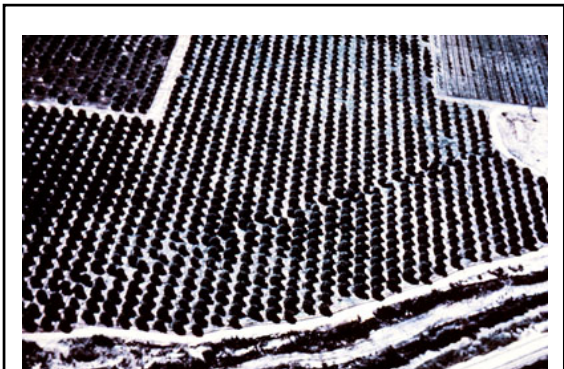




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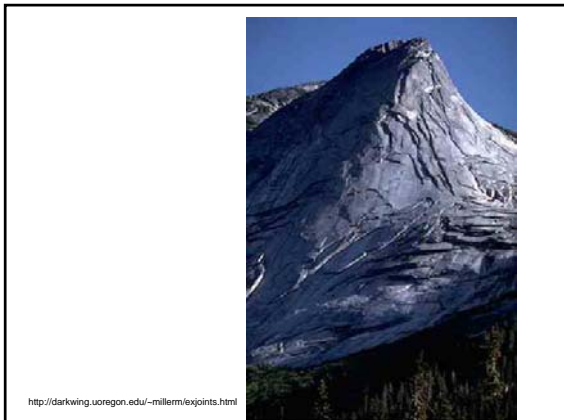
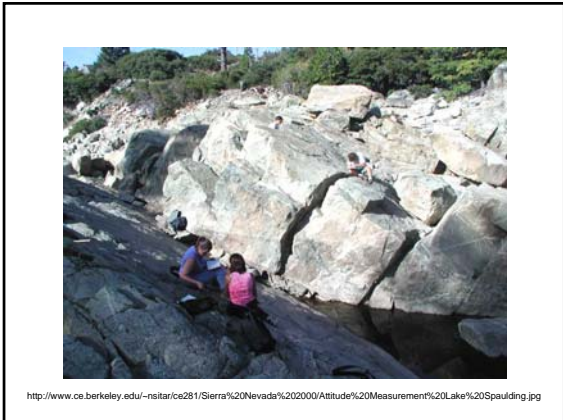
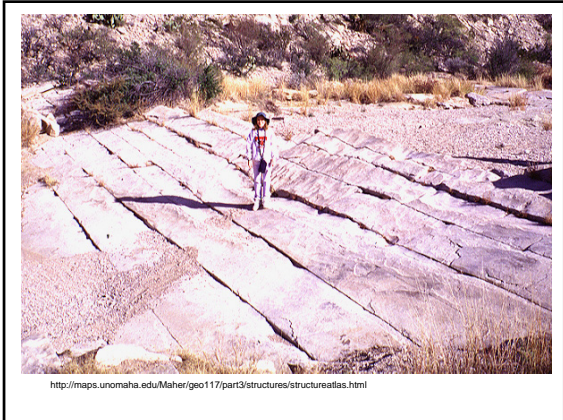
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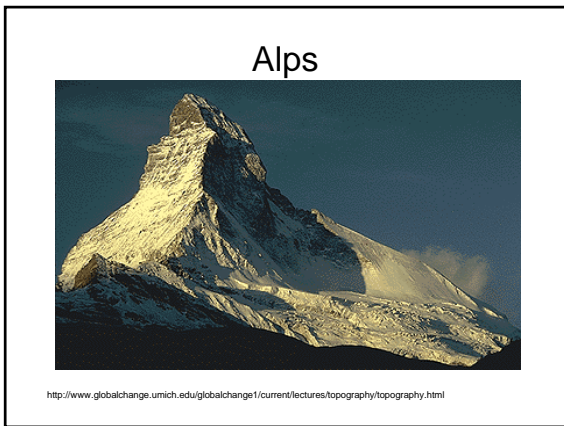
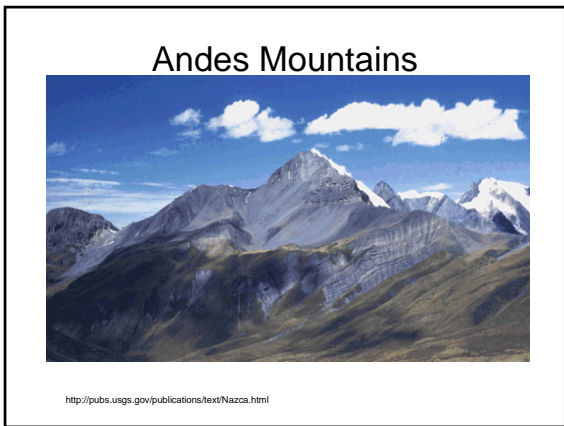
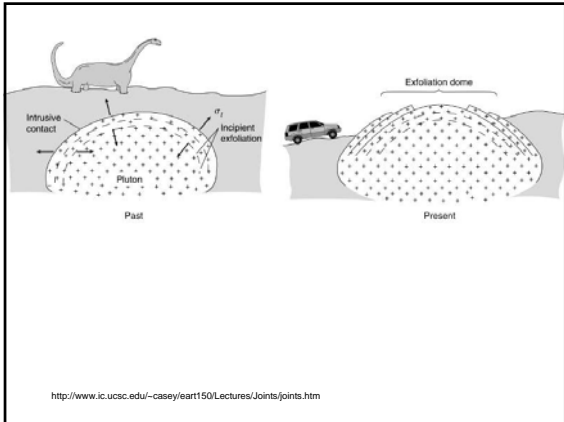


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<http://www.geology.wisc.edu/~maher/air/air05.htm>



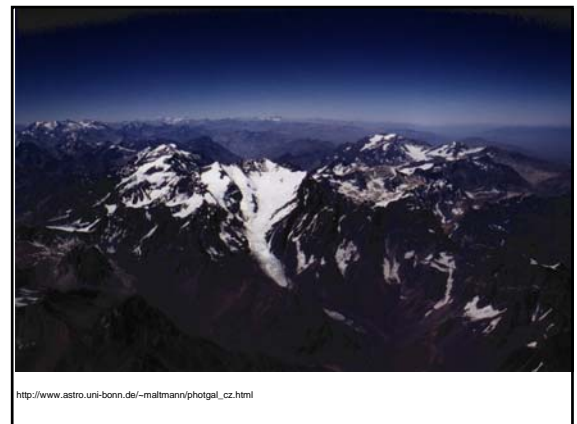
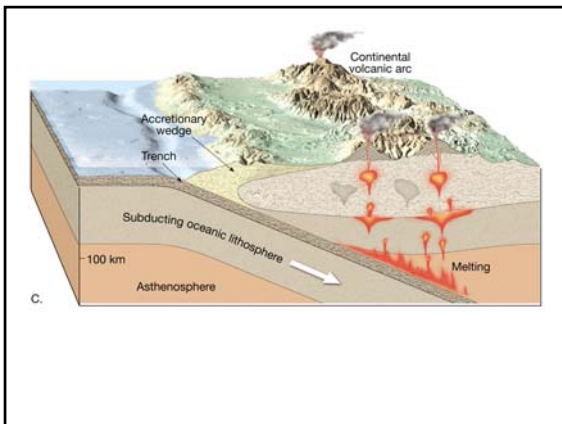
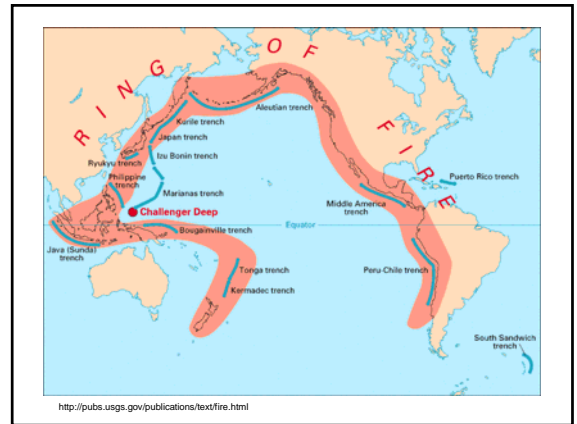
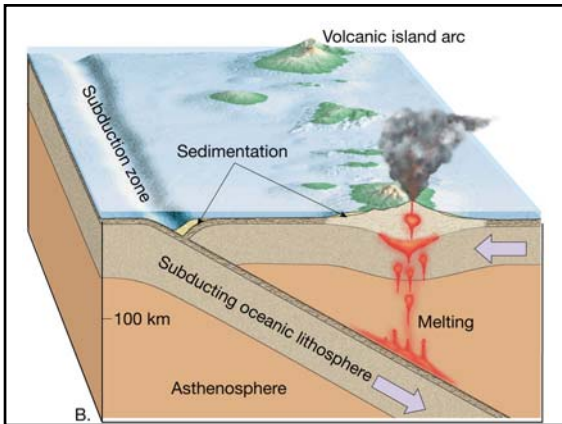


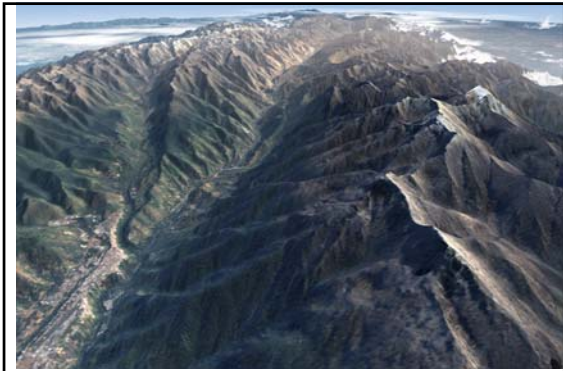


Taken on the [STS-56 shuttle](#) mission, in April 1993. Image number: STS056-071-031
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<http://home.earthlink.net/~nator0/>, with permission of author tom bigley
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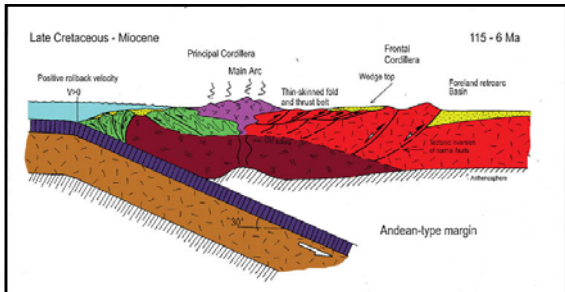




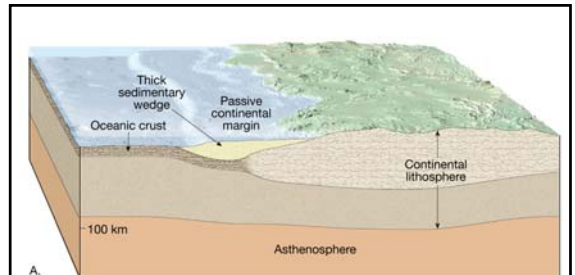
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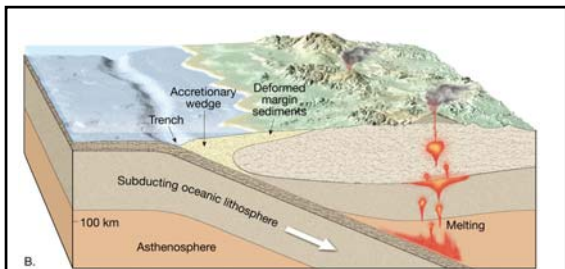


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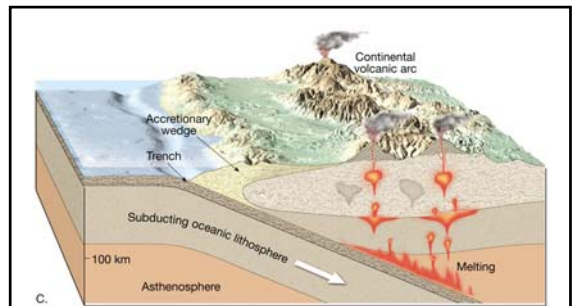


A.

Continental volcanic arc

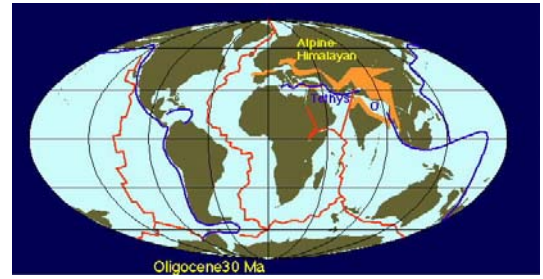
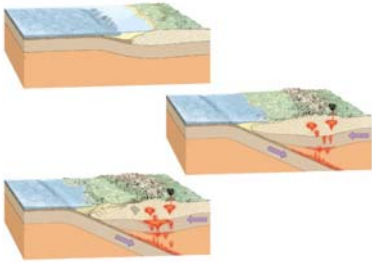


B.

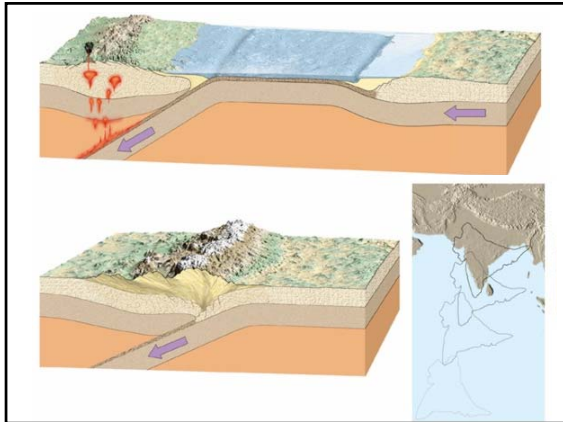


C.

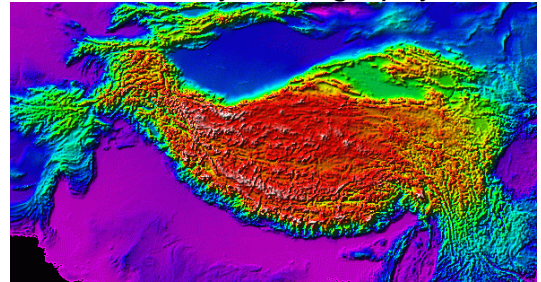
Stages of orogenesis



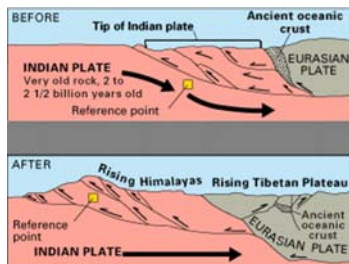
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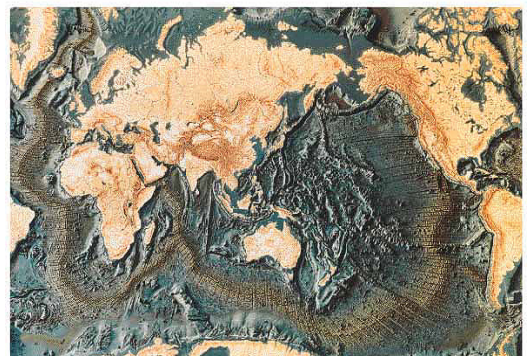
Himalaya topography



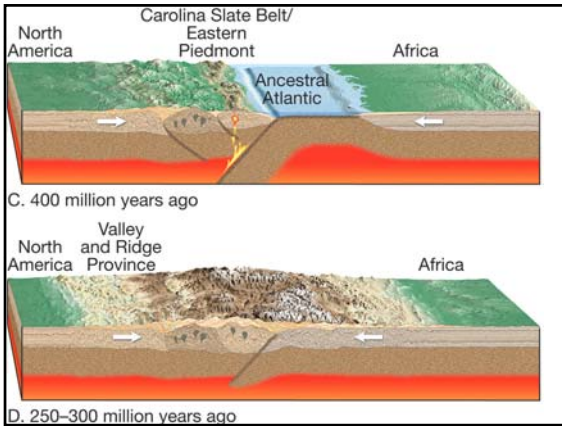
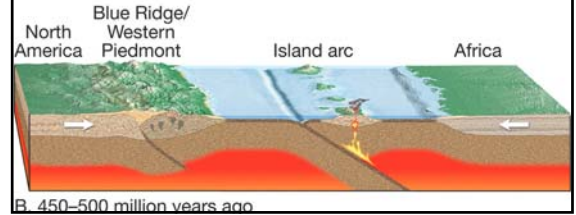
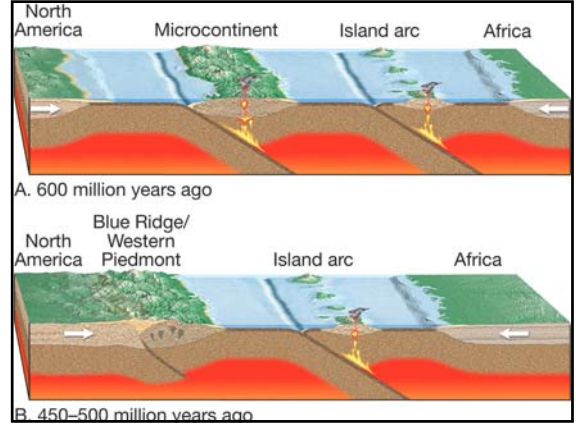
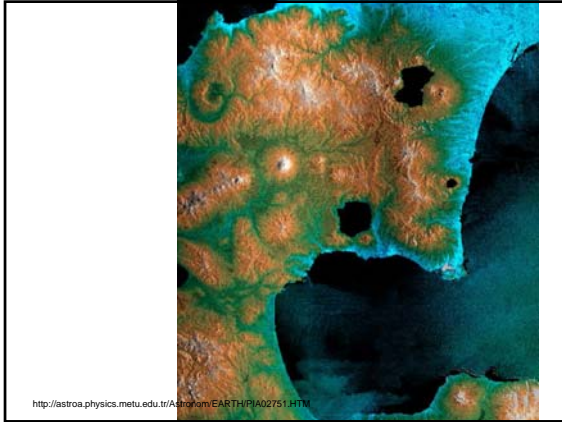
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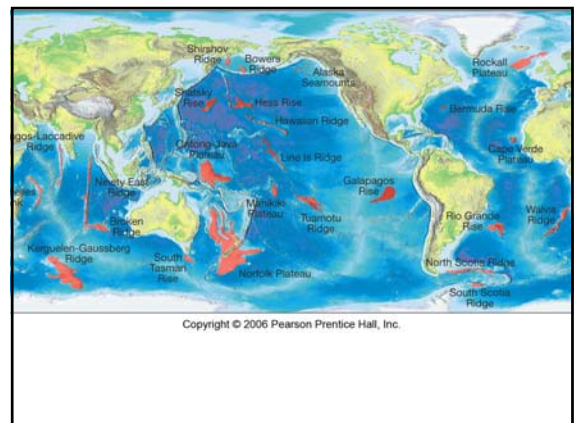


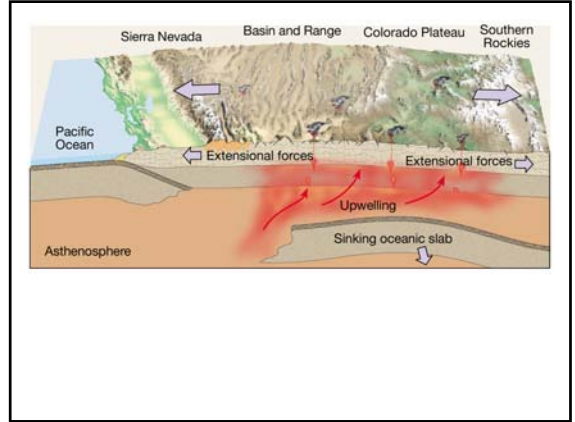
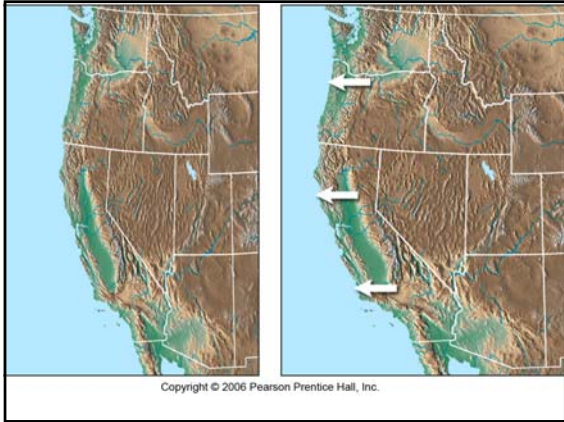
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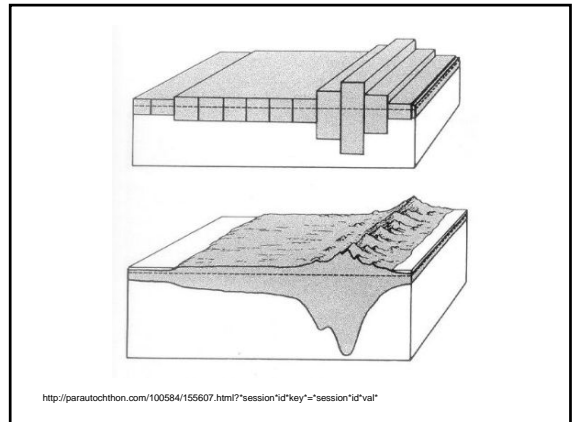
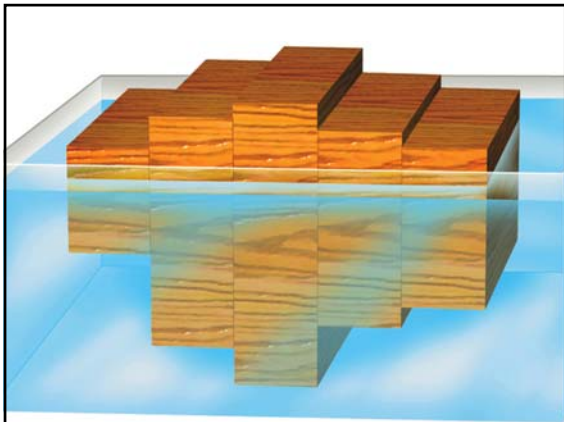
Western North America

- Accreted terranes

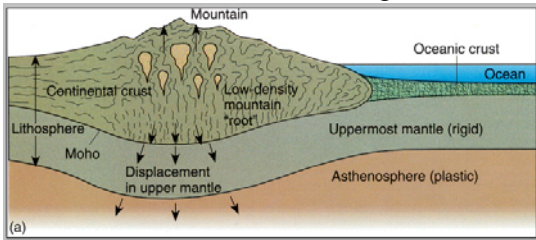




North American mountain belts

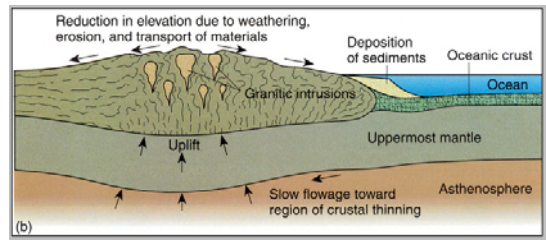


Crustal subsidence due to mountain building



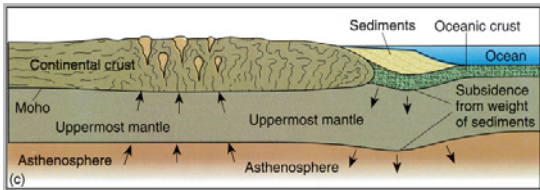
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Unloading by erosion allows isostatic rebound



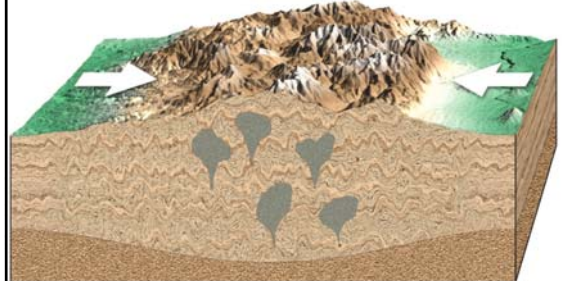
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Deposited sediments locally loads margin



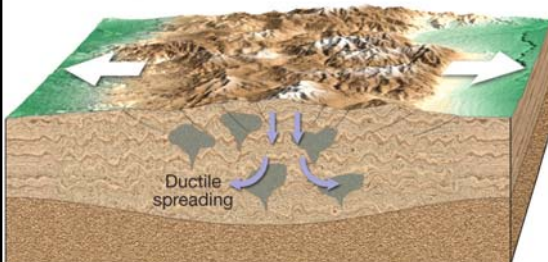
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Extreme uplift due to compression



A. Horizontal compressional forces dominate causing shortening and thickening of the crust

Ductile spreading after uplift



B. Gravitational forces dominate resulting in stretching and thinning of the crust

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