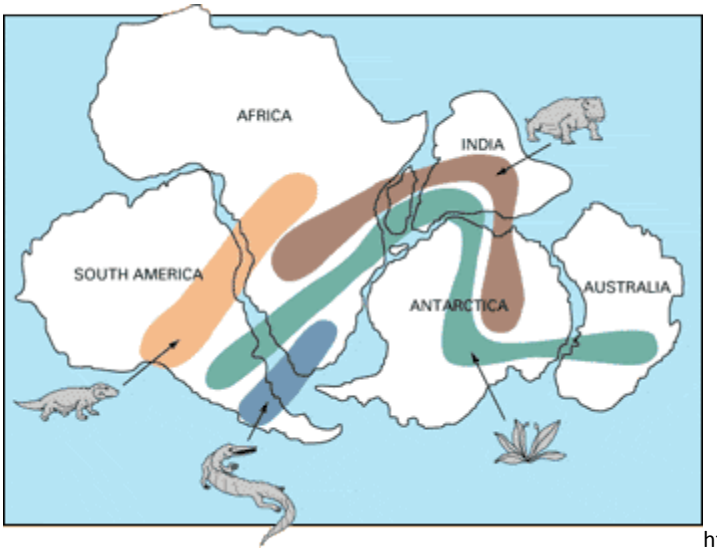
Plate tectonics

Continental drift (1915): idea proposed by Alfred Wegener that the continents started as one solid land mass and began floating apart.

Pangea:

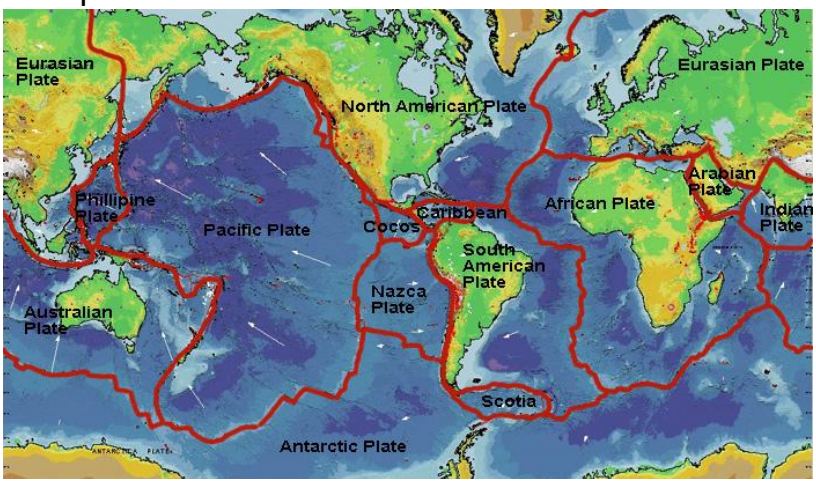
- Continents fit together
- Fossil records match the diagram of pangea
- Similar mountain range composition
- Similar mineral make-up fit diagram of pangea.



http://whyfiles.org/094quake/images/pangea.gif

Lithosphere (not crust)

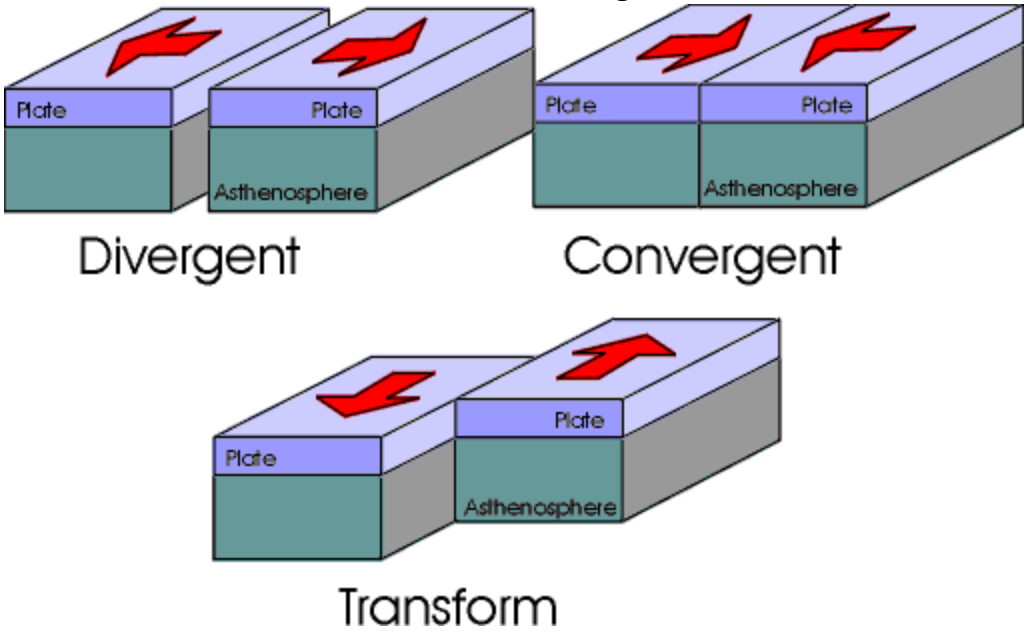
- Divided into plates → plates float on athenosphere, relative to each other.
- The movement of these plates forms mountains, volcanoes, oceans, and causes earthquakes.



http://www.windows.ucar.edu/earth/images/earth_plates_usgs_L.jpg

Plate boundaries

- **Divergent**: when plates of lithosphere move apart.
    - Builds oceans
- **Convergent**: when plates of lithosphere move together.
    - Ophioltes: sections of the oceantic crust that are uplifted and exposed within the continental crust.
    - Subduction: one plate moves below another plate.
        - Results in the loss of oceantic crust.
    - Builds mountains (orogeny)
- **Transform**: when plates slide sideways against each other.
    - Every plate has all three boundaries
    - Aulocogean: failed rift, when a plate stops moving.
    - Plate boundaries come and go.



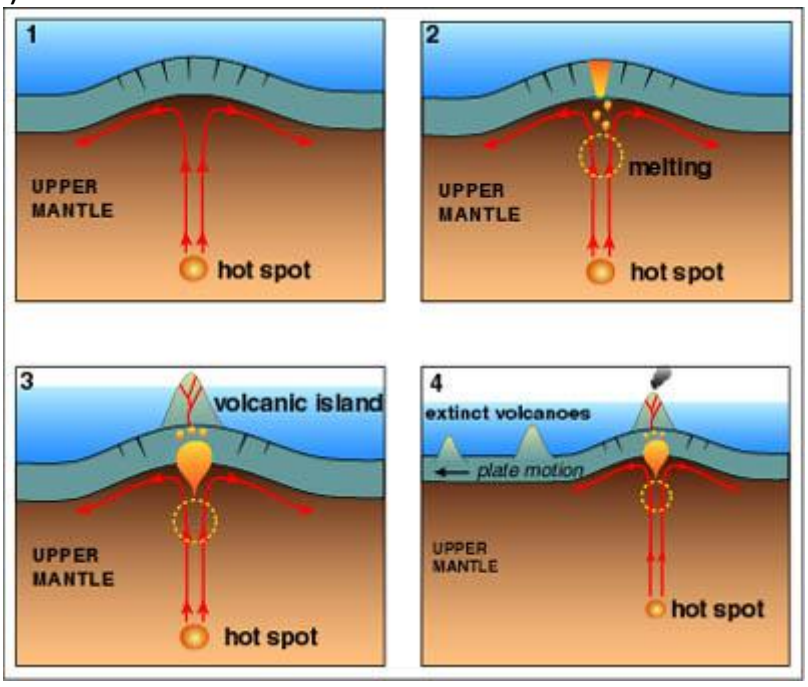
http://geology.csupomona.edu/drjessey/class/Gsc101/boundaries.gif

Environments

- **Orogenic**: involving plate boundaries
- **Cretonic**: not involving plate boundaries (no orogeny)
    - **Orogeny**: mountain building process.

Mantle plume: columns of hot rock, melted at the atheosphere, which find their way through the lithosphere.

- Formation of volcanoes and islands.
- Hot spot volcanoes: used to track plate movement over time. (seen in picture 4)



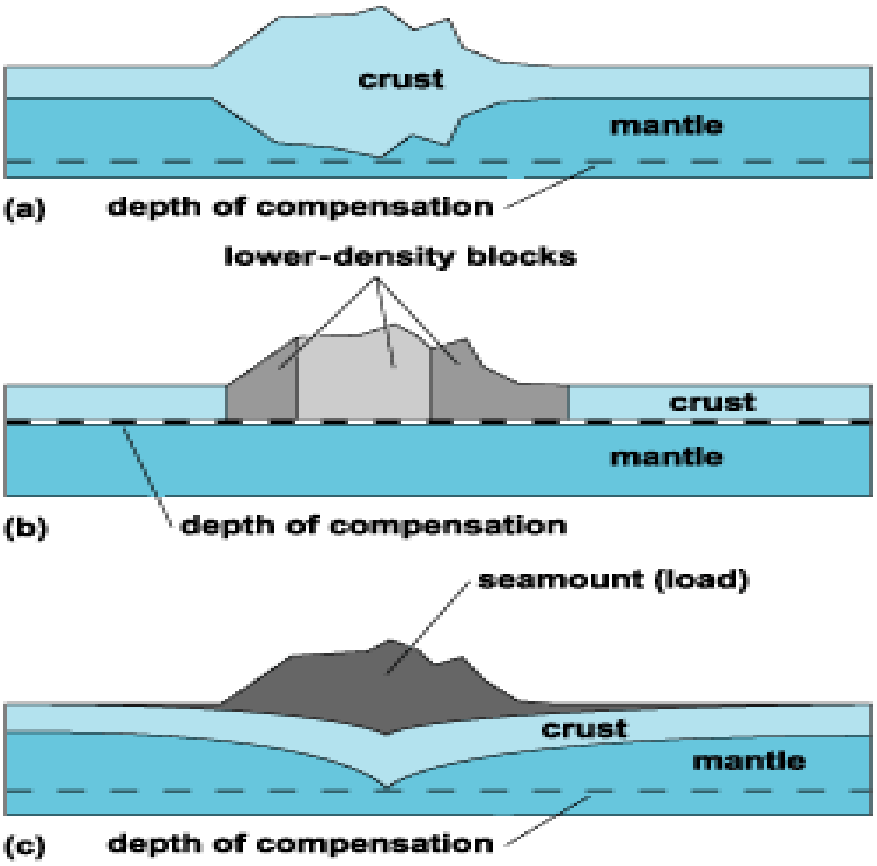
http://www.classroomatsea.net/general_science/images/plume_sequence.jpg

Isostocy: a relationship between the gravity, the lithosphere, and the athenosphere.

- The more dense the lithosphere, the more it sinks into the athenosphere.
- The less dense the lithosphere, the more it sinks into the athenosphere.
- Continental crust is less dense than oceanic crust
    - Oceantic crust sinks lowers than continental crust so it forms oceans.

Isostatic adjustments:

- **Isostatic uplift**: subduction pieces rise back to the crust and push up. (orogeny)
- **Erosion:** depletion off the top, deposited on the side, leads to athenoshere pushing up.



http://content.answers.com/main/content/img/McGrawHill/Encyclopedia/images/CE356500FG0010.gif