

# Plate Tectonic Review, Types of Plates

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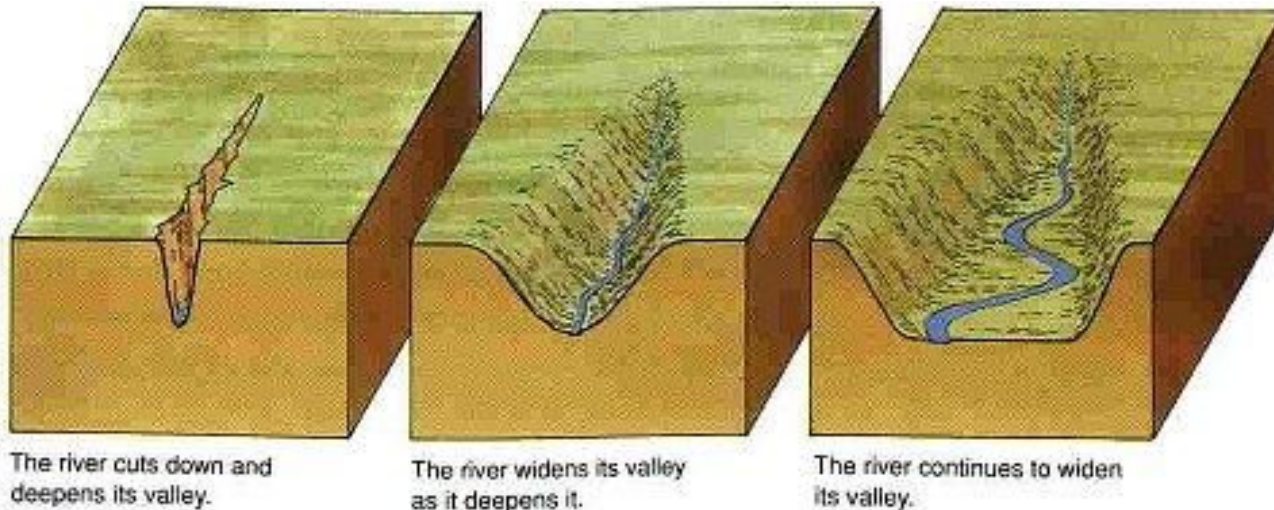
# Review from last week:

1. Alfred Wegener: thought that sections of the Earth's crust moved, but people were confused, and thought that continents drifted over water
  - a. Proof was found by putting pieces of continents together, finding fossils and similar plants on opposite sides of the Atlantic
2. Henry Hess: using sonar technology, he found that the oceans had mid-ridges in their centre and were slowly breaking apart
3. J Tuzo Wilson: found that there were 20 plates in total, and moved over a hot layer of rock very slowly
4. (convection currents: as fluid rises and carries heat with it, it is replaced with cooler fluid which in turn rises again)

# Review from last week:

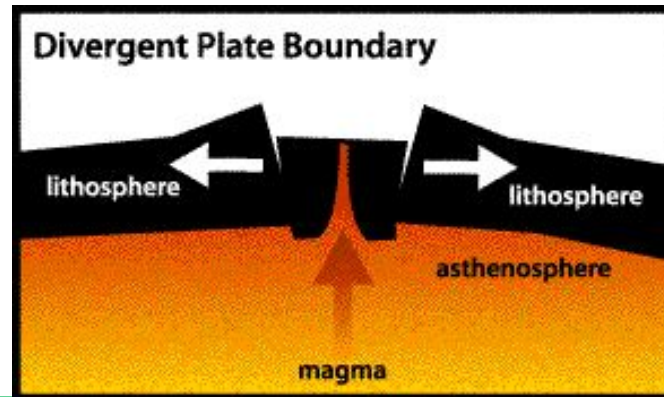
## Forces that Shape our Natural Environment

1. Tectonic Forces - interior process of the Earth (e.g. earthquakes, volcanoes, mountain/land building)
2. Erosional Forces (weathering) - is the breaking down of the Earth's crust. Wind, water and ice are examples of erosional forces.



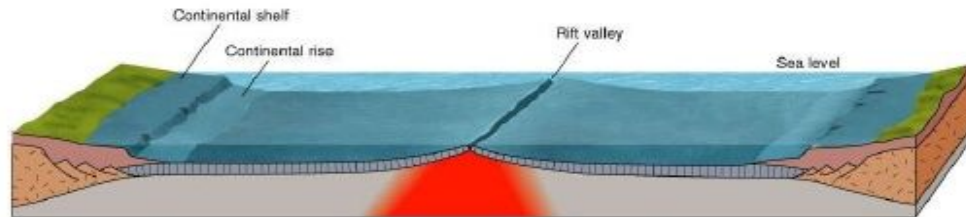
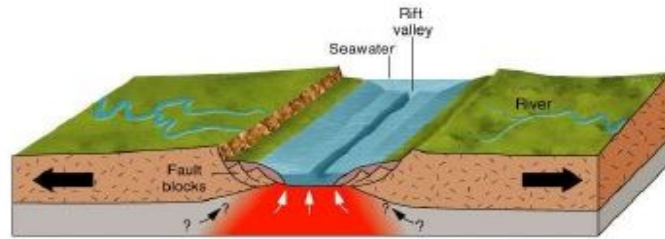
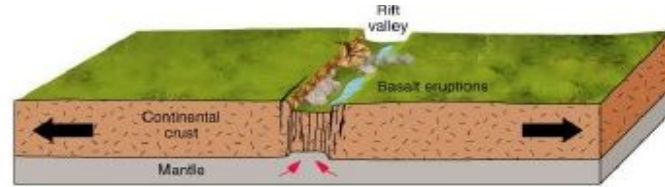
# Divergent / Spreading Boundary

1. Places where plates are coming apart are called divergent boundaries.
2. When the Earth's brittle surface layer (the lithosphere) is pulled apart, it typically breaks along parallel faults that tilt slightly outward from each other,
3. The block between the faults cracks and drops down into the soft, plastic-like interior (the asthenosphere). The sinking of the block forms a central valley called a rift. Magma (liquid rock) seeps upward to fill the cracks.
4. In this way, new crust is formed along the boundary. Earthquakes occur along the faults, and volcanoes form where the magma reaches the surface.



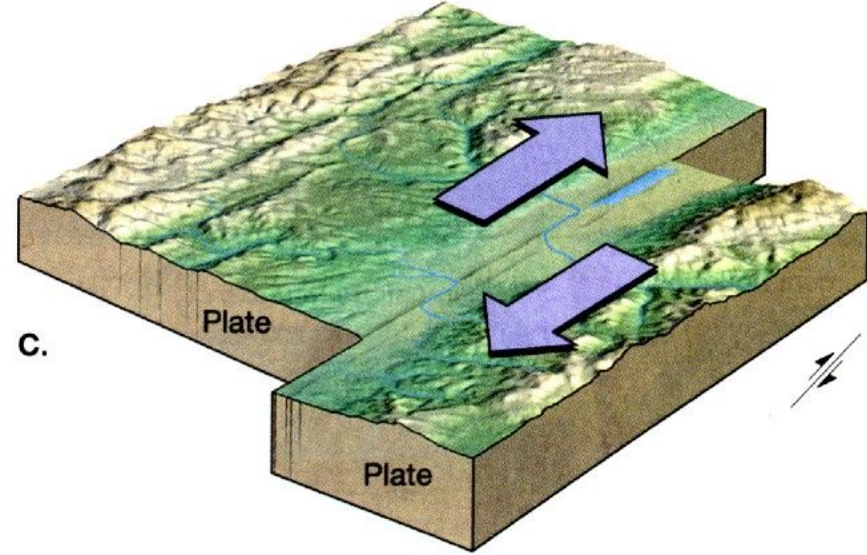
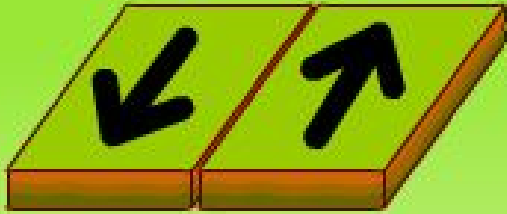
# Divergent / Spreading Boundary

- Plate separation is a slow process. For example, divergence along the Mid Atlantic ridge causes the Atlantic Ocean to widen at only about 2 centimeters per year.

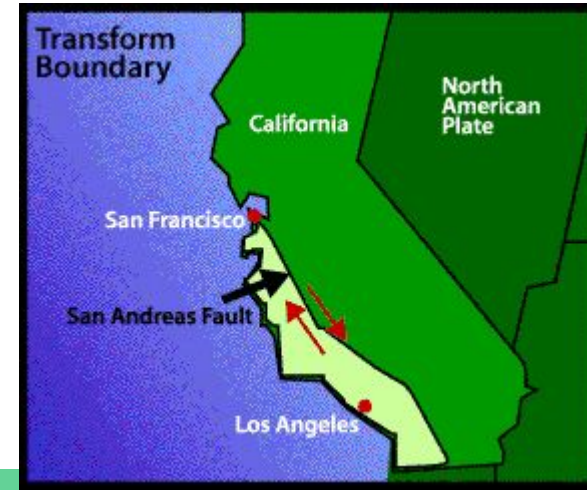


# Transform/Spreading Boundary

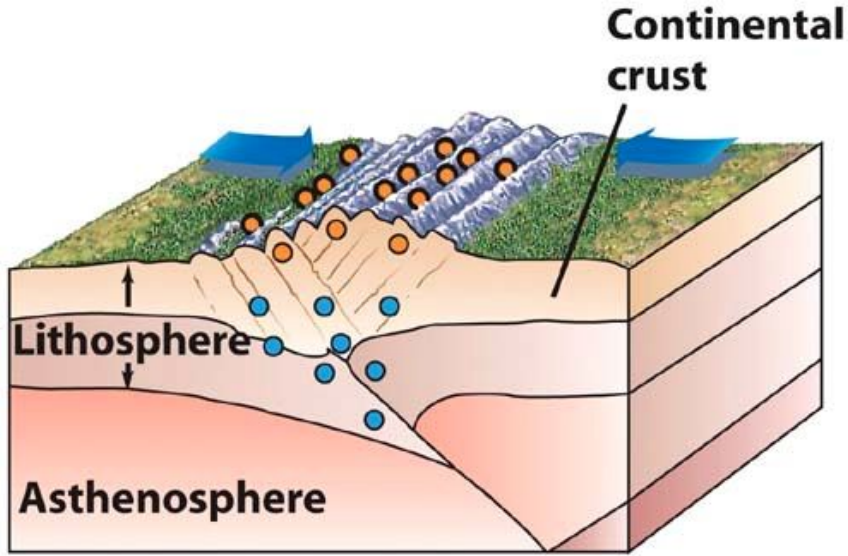
A transform boundary occurs where two plates slide past each other.



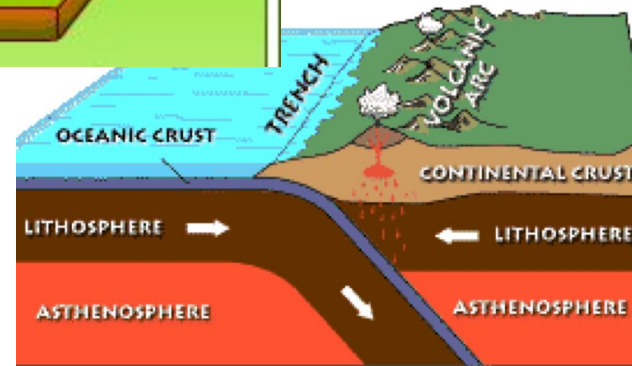
- These plates are slowly sliding past each other (San Francisco and Los Angeles, for example, are slowly sliding towards each other; they'll meet in 10 million years, closing in at each other at 6 cm per year)
- The sliding can cause earthquakes (San Andreas Fault, San Francisco)



# Convergent Plate



A convergent boundary occurs where two plates are pushing toward each other.



**Without Subduction:** If the same kind of crust collides, such as continent-continent, the plates may crash together without subducting and crumple together like crashing cars. The massive [Himalaya](#) mountain chain was created this way, when India slammed into Asia.

**With Subduction:** Where two [tectonic plates](#) meet at a subduction zone, one bends and slides underneath the other, curving down into the mantle. (The mantle is the hotter layer under the crust.)

# Types of plates - interactive

<http://www.learner.org/interactives/dynamicearth/plate.html>

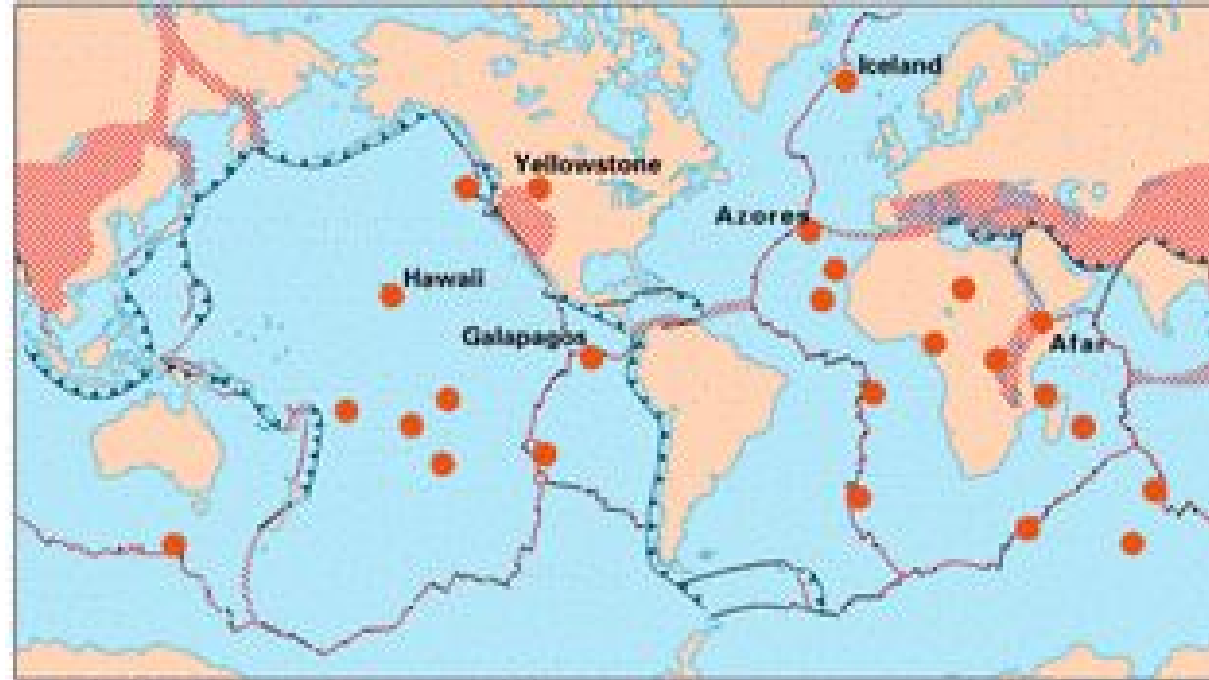


# Volcanoes



- Last week we looked at an example of an earthquake and Tsunami (we'll learn more about Tsunamis later); today we'll look at examples of a Volcano.
- There are three main places where **volcanoes** originate: Hot spots (within a plate region), Divergent **plate boundaries** (such as rifts and mid-ocean ridges), and Convergent **plate boundaries** (subduction zones)
- The Formation of Volcanoes:
  - a. Magma rises through cracks or weaknesses in the Earth's crust.
  - b. Pressure builds up inside the Earth.
  - c. When this pressure is released, eg as a result of plate movement, magma explodes to the surface causing a volcanic eruption.
  - d. The lava from the eruption cools to form new crust.
  - e. Over time, after several eruptions, the rock builds up and a volcano forms.
- <https://curio.ca/en/video/mount-st-helens-a-giant-wakes-up-2058/>




# Hot spots

A third tectonic setting where volcanism occurs is called **intraplate**- or **hot-spot**-volcanism, which describes volcanic activity that occurs *within tectonic plates* and is generally NOT related to plate boundaries and plate movements.



## EXPLANATION

-  Divergent plate boundaries—Where new crust is generated as the plates pull away from each other.
-  Convergent plate boundaries—Where crust is consumed in the Earth's interior as one plate dives under another.

-  Transform plate boundaries—Where crust is neither produced nor destroyed as plates slide horizontally past each other.
-  Plate boundary zones—Broad belts in which deformation is diffuse and boundaries are not well defined.
-  Selected prominent hotspots

<https://www.youtube.com/watch?v=AhSaE0omw9o>