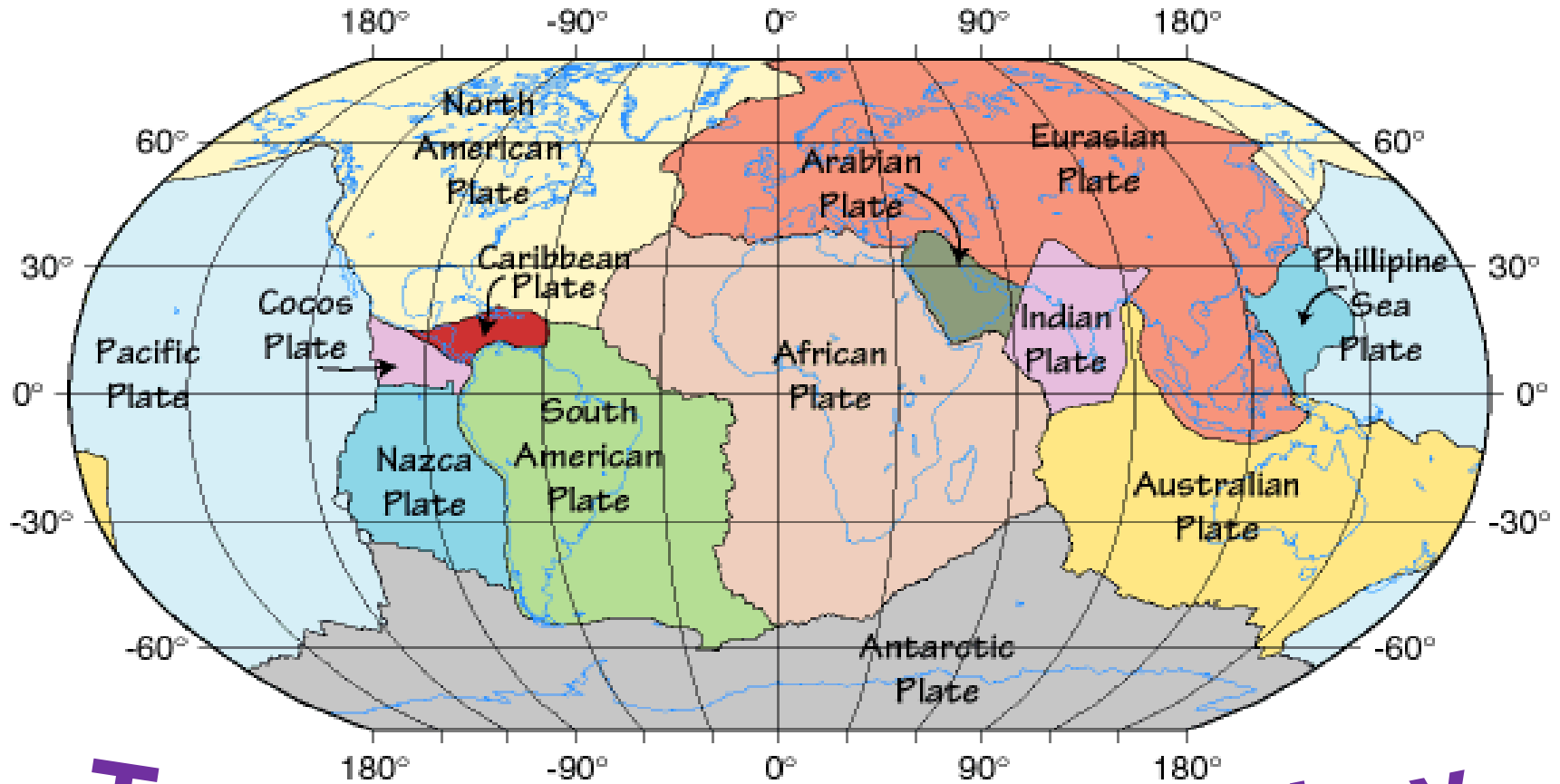


Lithosphere Part 2

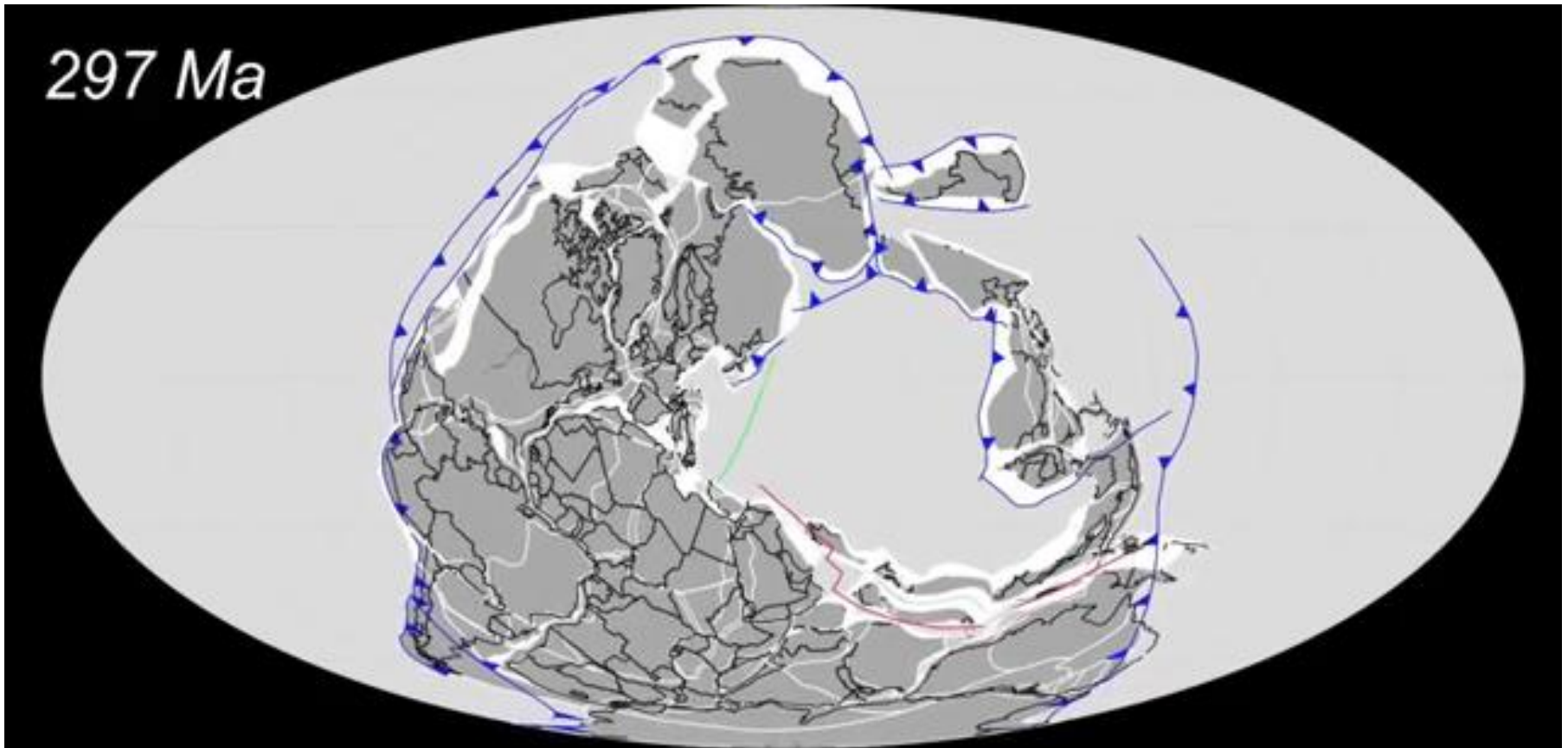


**Tectonic
Plates**

and

**How They
Move**

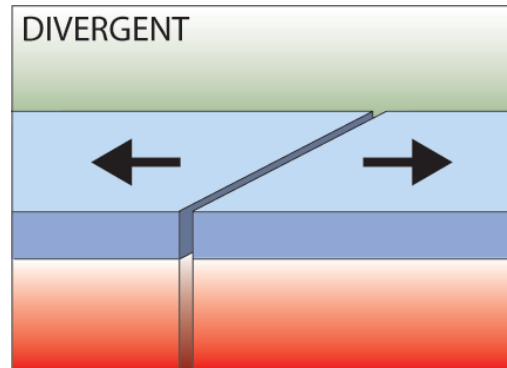
Plate Movement Simulation (past 300 million years)



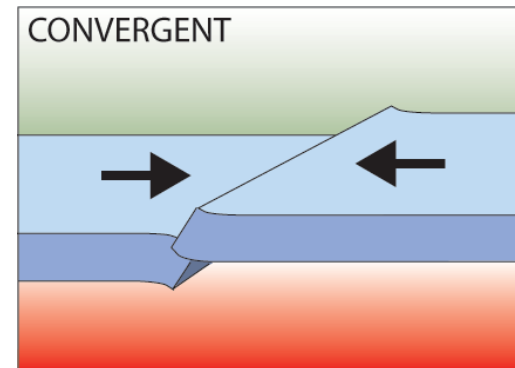
<https://www.youtube.com/watch?v=llnwyAbczog>

Three types of plate boundary

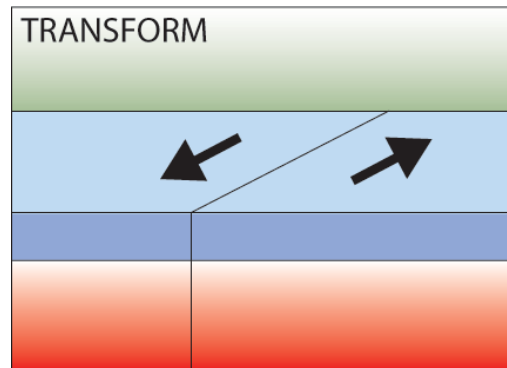
- **Divergent**



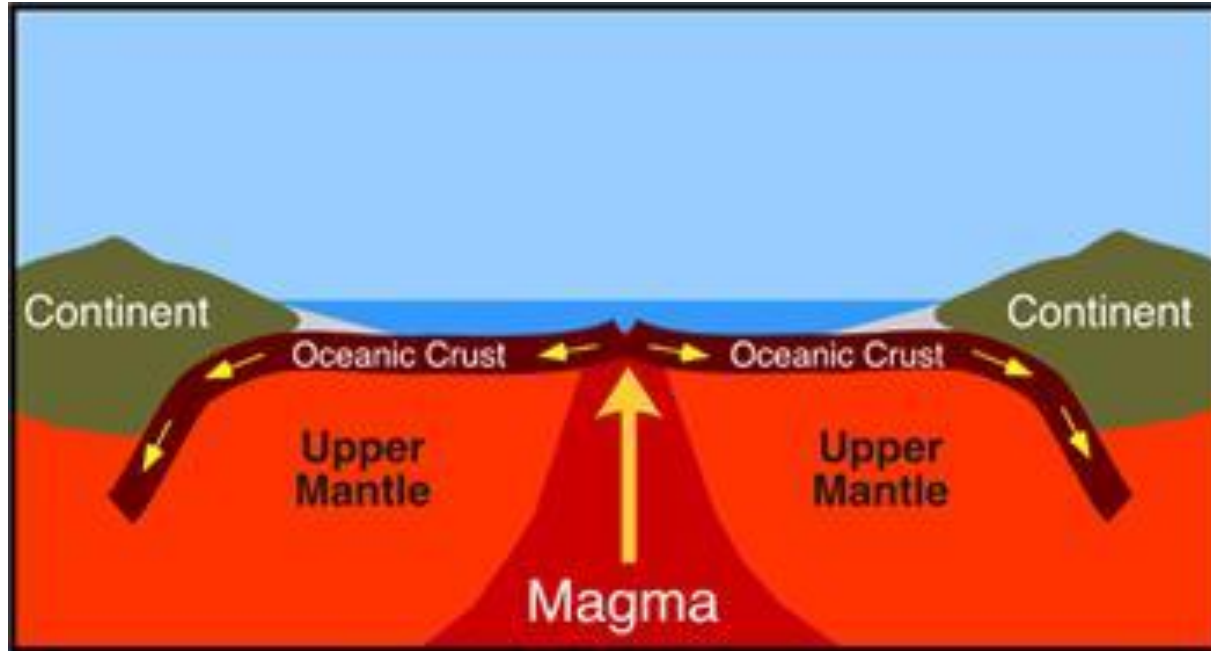
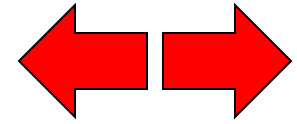
- **Convergent**



- **Transform**



Divergent Boundaries

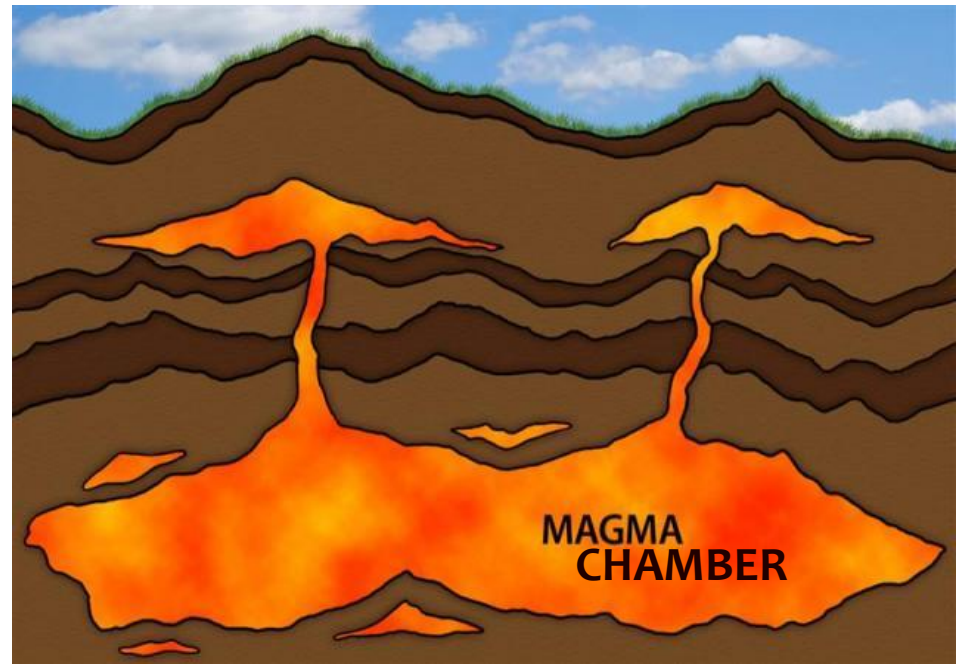
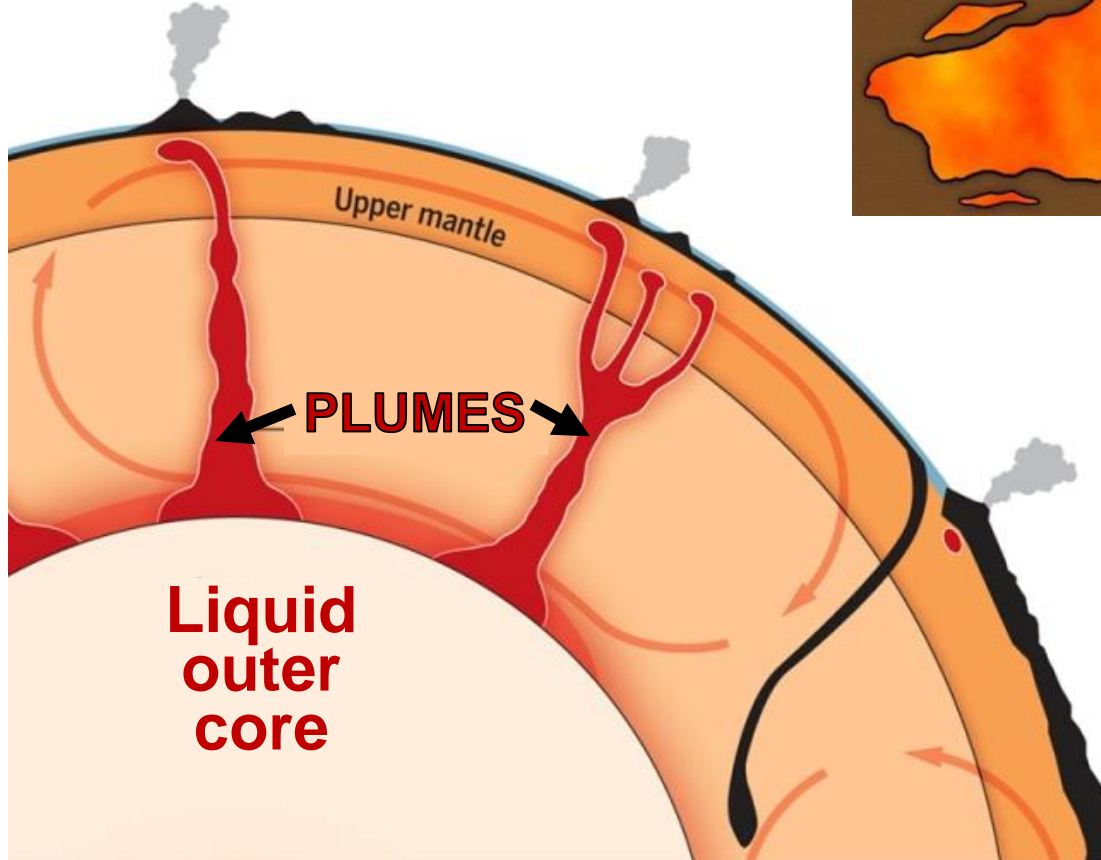


- **Spreading ridges:**
 - as plates **move apart**, new material is **erupted** to fill the gap
 - young crust is formed

What is magma and where does it come from?

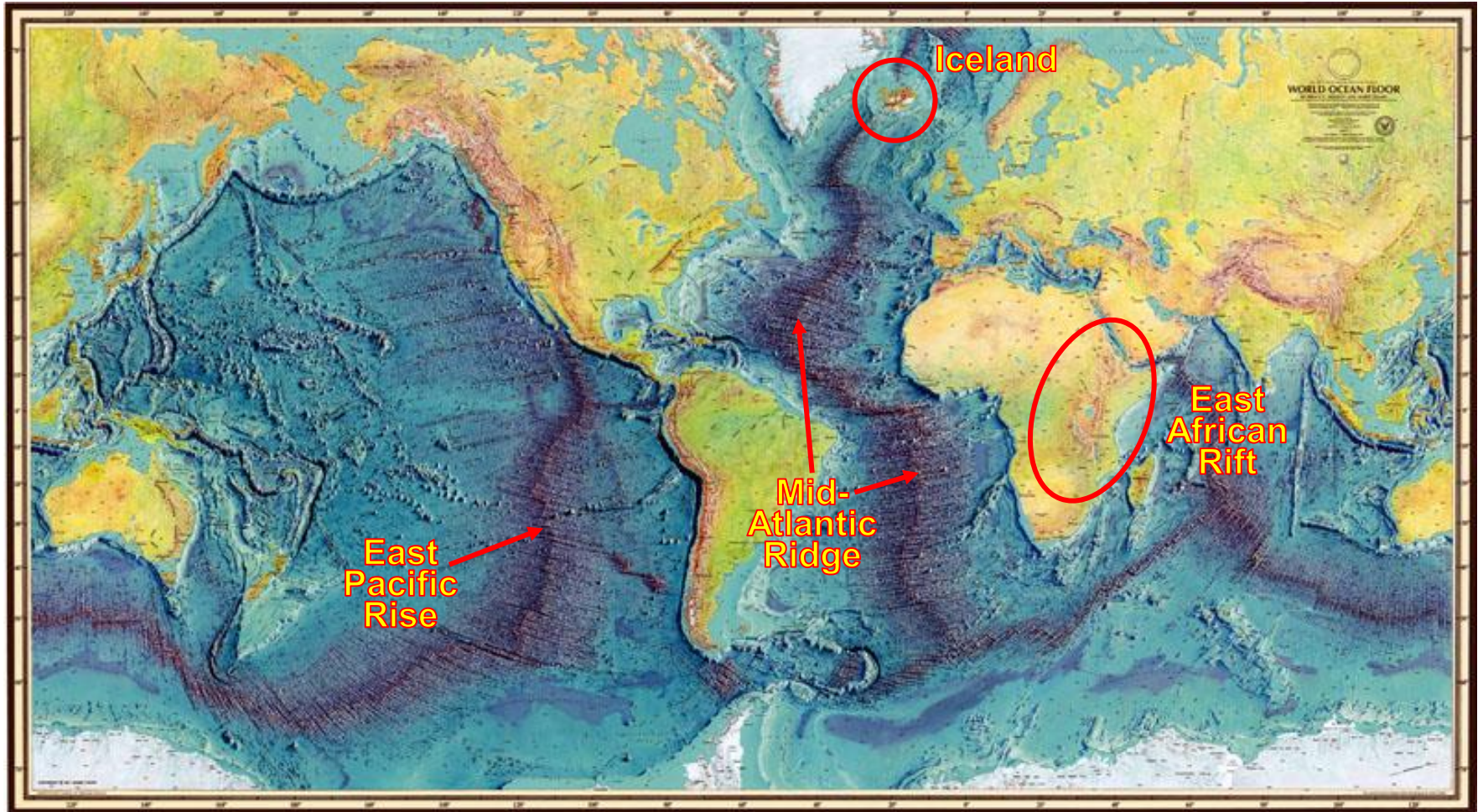
Magma

- Partially molten rock found in high temperature, low pressure environments beneath the Earth's surface.



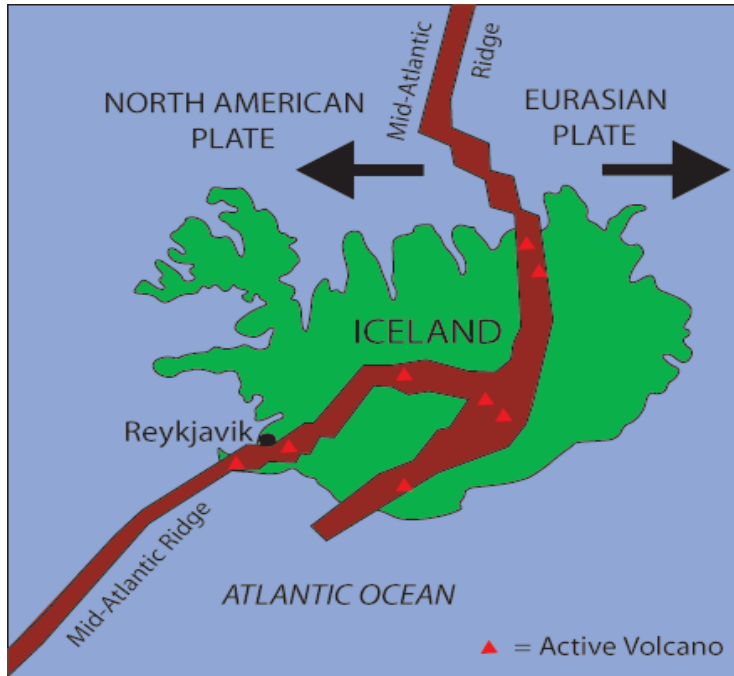
- Develops and collects in **magma chambers** usually within several miles of the Earth's surface.
- May also rise in **mantle plumes** directly from the outer core/mantle boundary.

World's Ocean Ridges and Continental Rifts



The ocean floor is not flat! It has well-pronounced **mountain ridges** running along the spreading plate boundaries.

Iceland: an example of continental drift

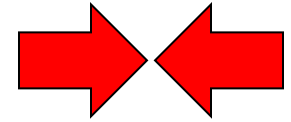


Iceland has a ***divergent plate boundary*** running through its middle.

In fact, the island exists because of this feature!

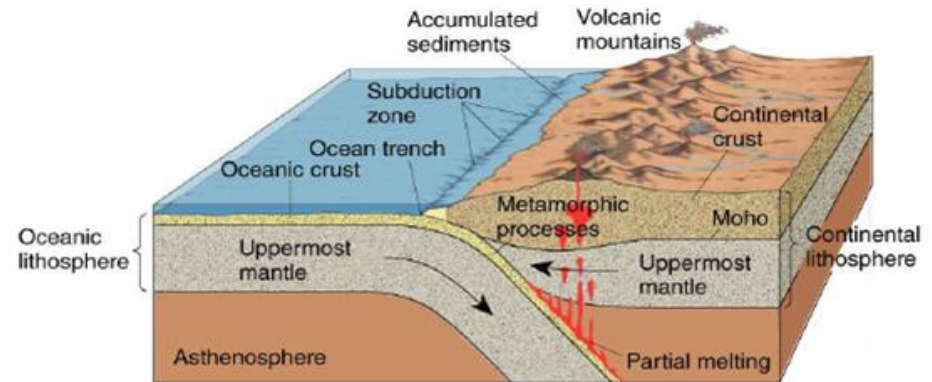


Convergent Boundaries

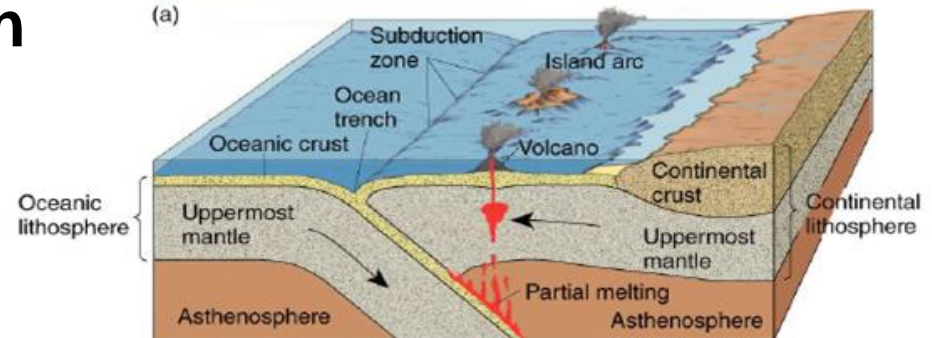


Three types:

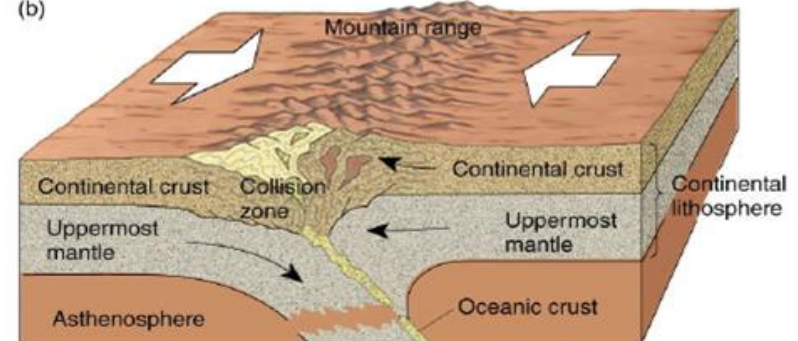
- Continent-oceanic crust collision
- Ocean-ocean collision
- Continent-continent collision



(a)



(b)

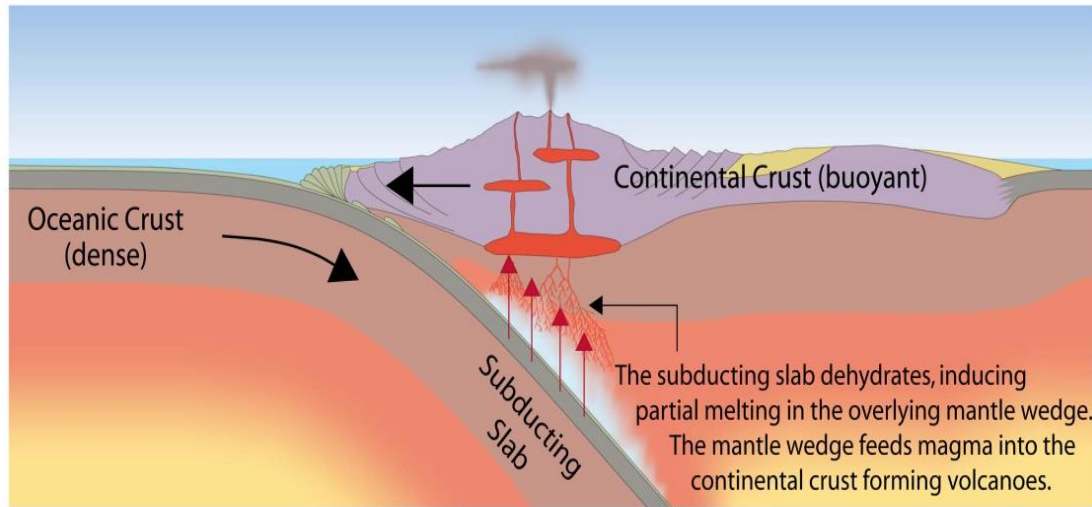


(c)

Convergent boundaries are also called destructive plate boundaries.

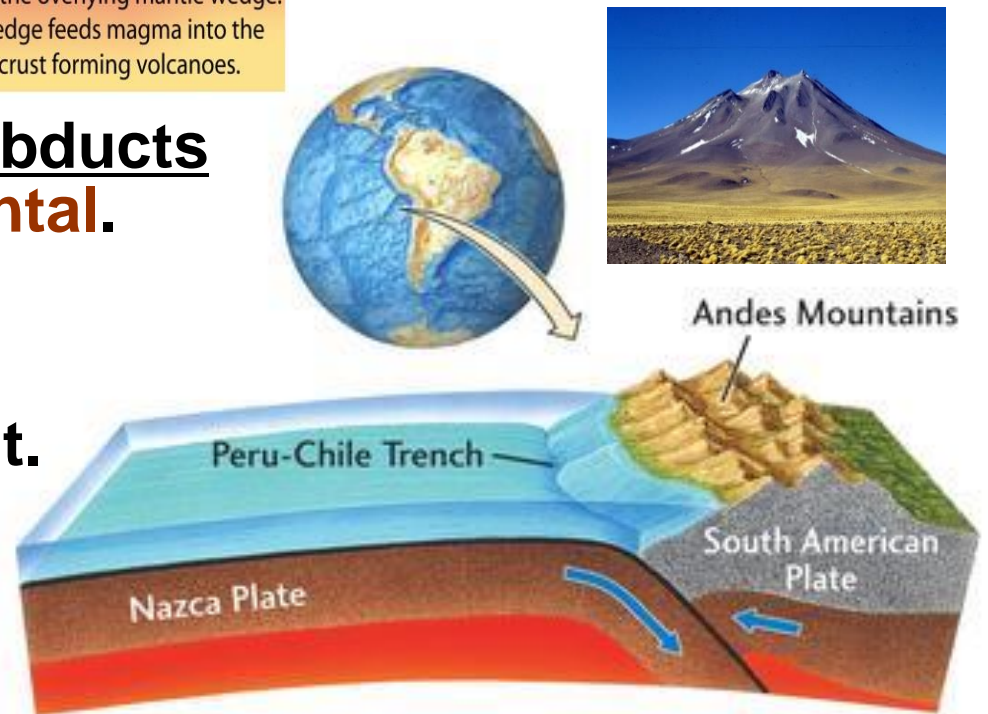
Why?

Continent-Oceanic Crust Collision



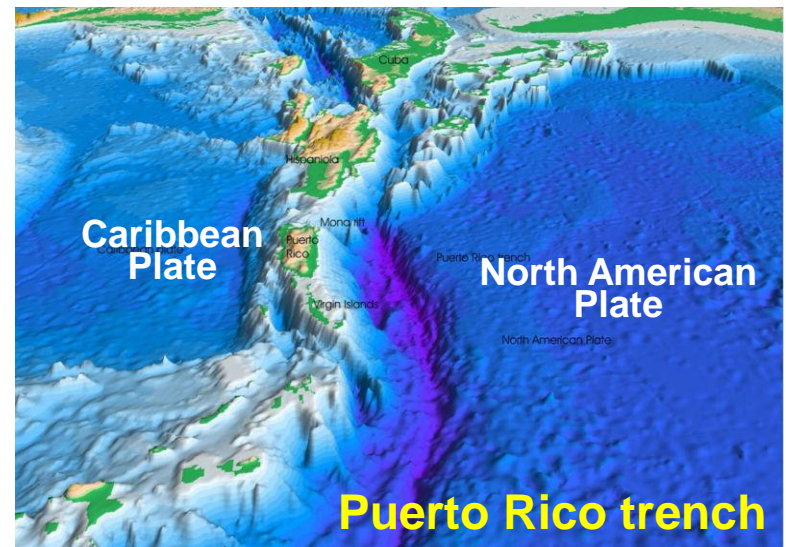
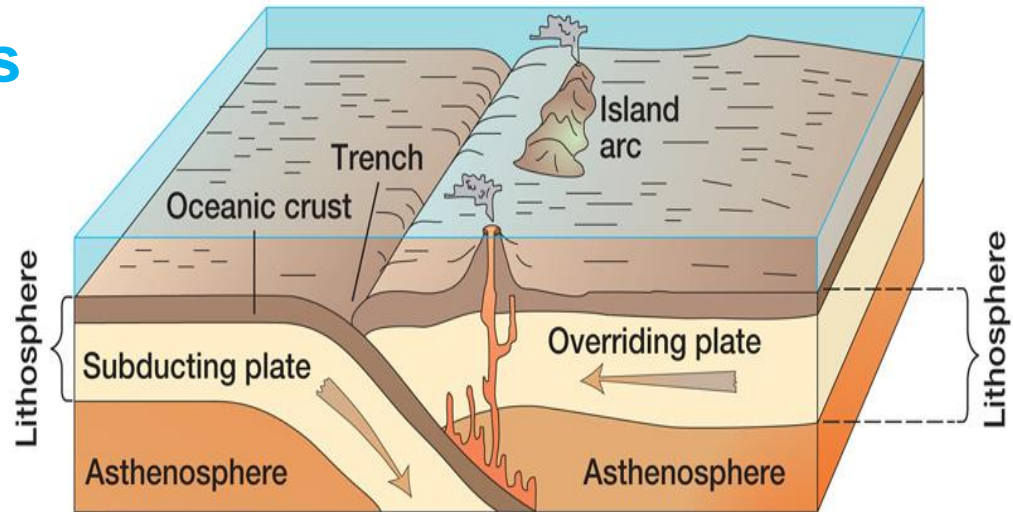
“Subduction”-
the *denser plate*
moves *under* the
less dense one

- **Oceanic lithosphere subducts underneath the continental.**
- **As it subsides, oceanic lithosphere slab heats and induces mantle melt.**
- **This results in volcanic mountains formation (example: The Andes).**



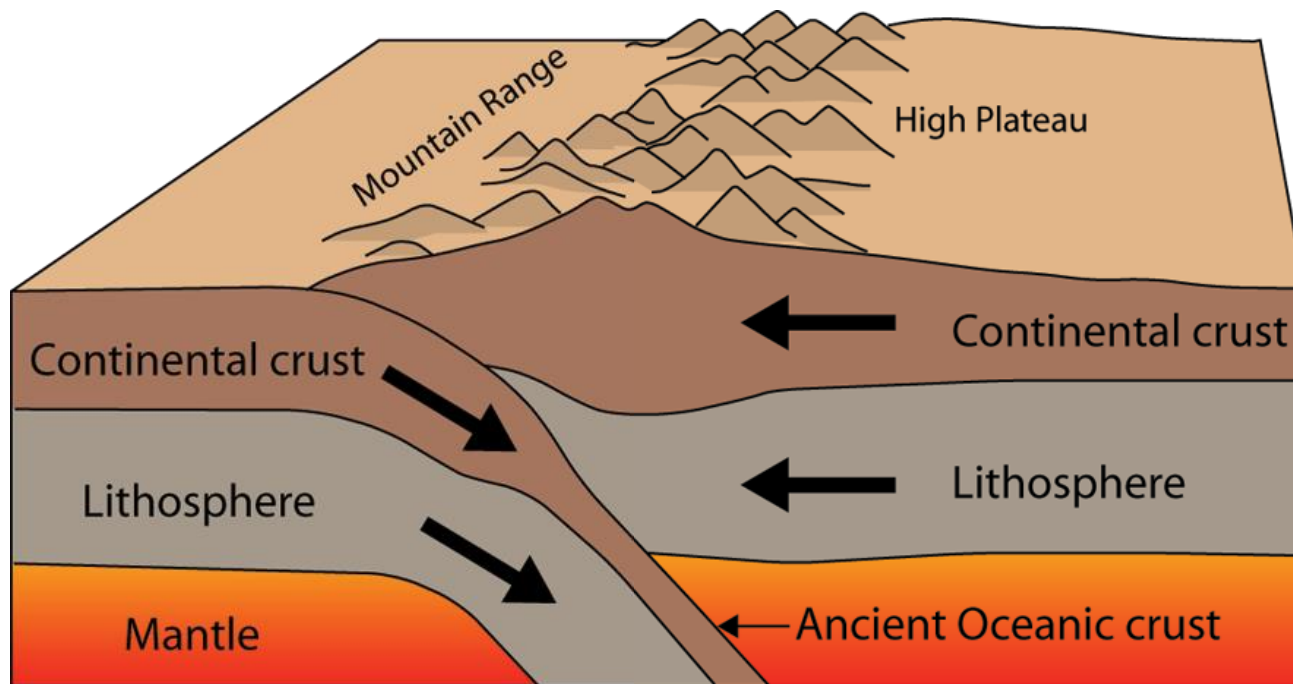
Ocean-Ocean Plate Collision

- When **two oceanic plates** collide, the **younger one runs over the older one** which causes it to sink into the mantle forming a **subduction zone**.
- The subducting plate is bent downward to form a **very deep depression** in the ocean floor called a **trench**.
- **Volcanic island arc** is usually formed fairly close to, but not right next to, the trench.
(ex: Mariana Islands, Aleutian Islands, Solomon Islands, Lesser Antilles)



Continent-Continent Collision

- **Plates push against each other**
the crust buckles and cracks, pushing up (and down into the mantle)

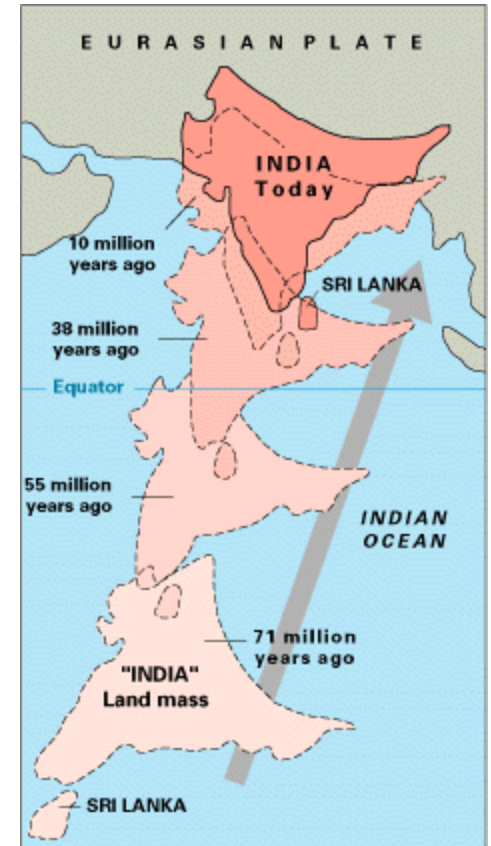


- **Forms mountains (European Alps, Himalayas) and high plateaus**

Himalayan Range is home to more than **one hundred mountains exceeding 7,200 m (23,600 feet) in elevation, and all the planet's peaks exceeding 8,000 m, including the highest, Mount Everest.**



Mount Everest



Currently standing at **8,848.86 m (29,031.7 ft)** Mount Everest still *grows* **~4 mm/year!**

