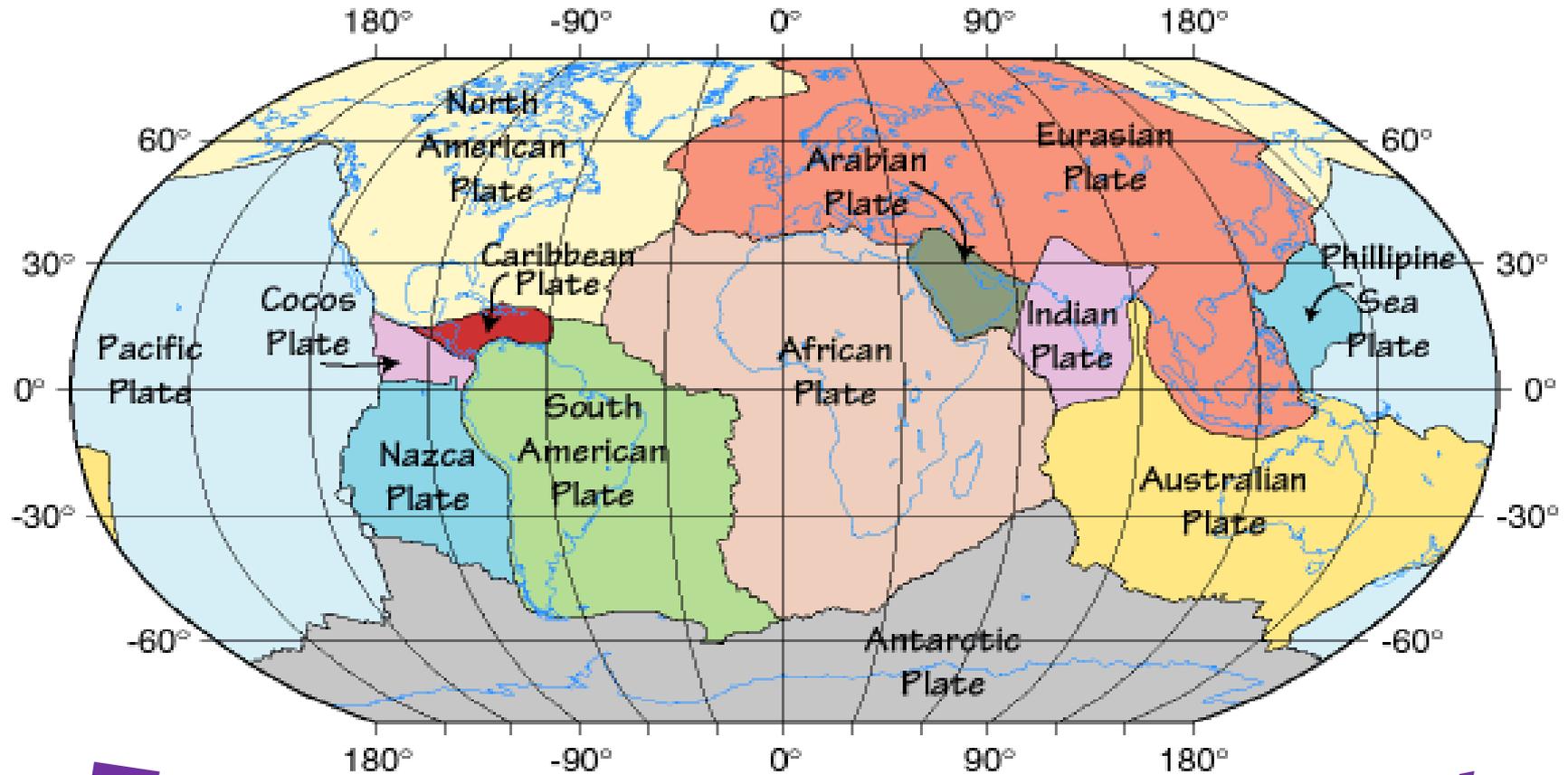


Lithosphere

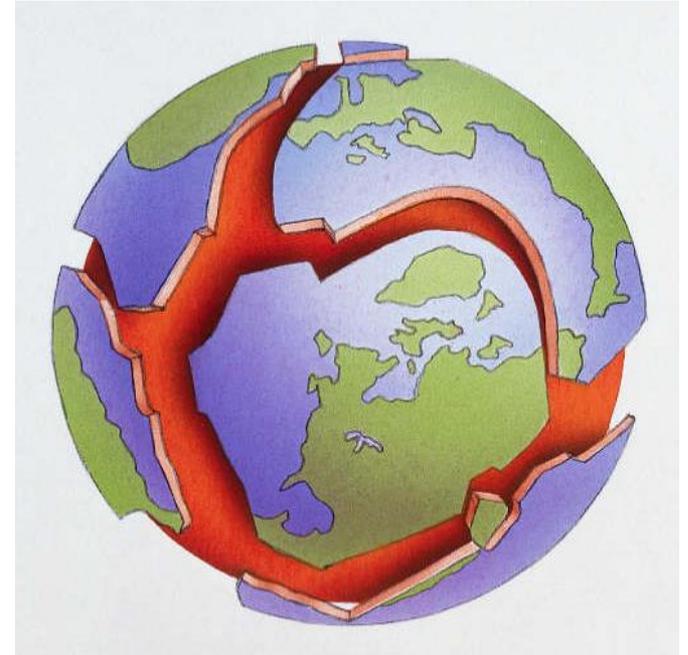
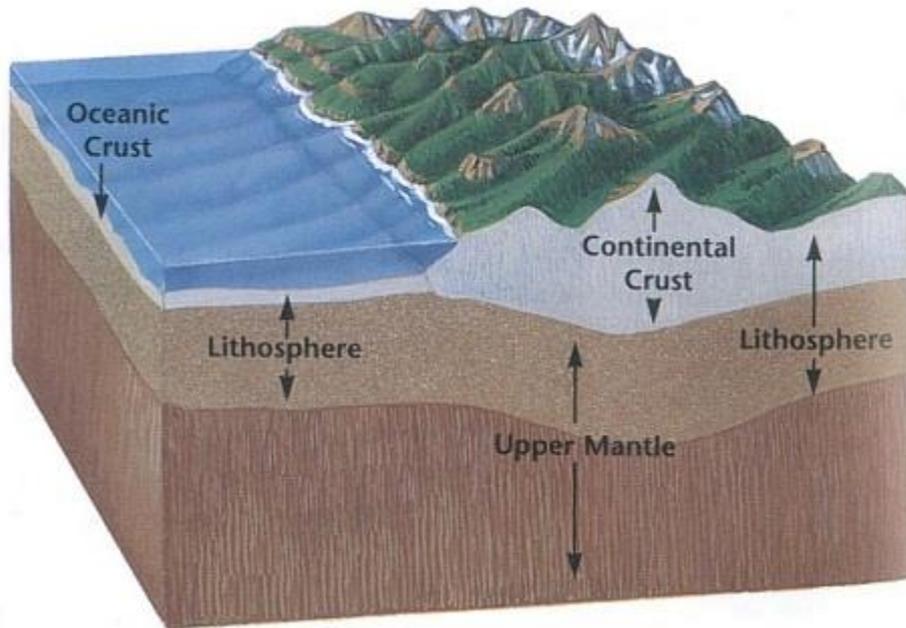


**Tectonic
Plates**

and

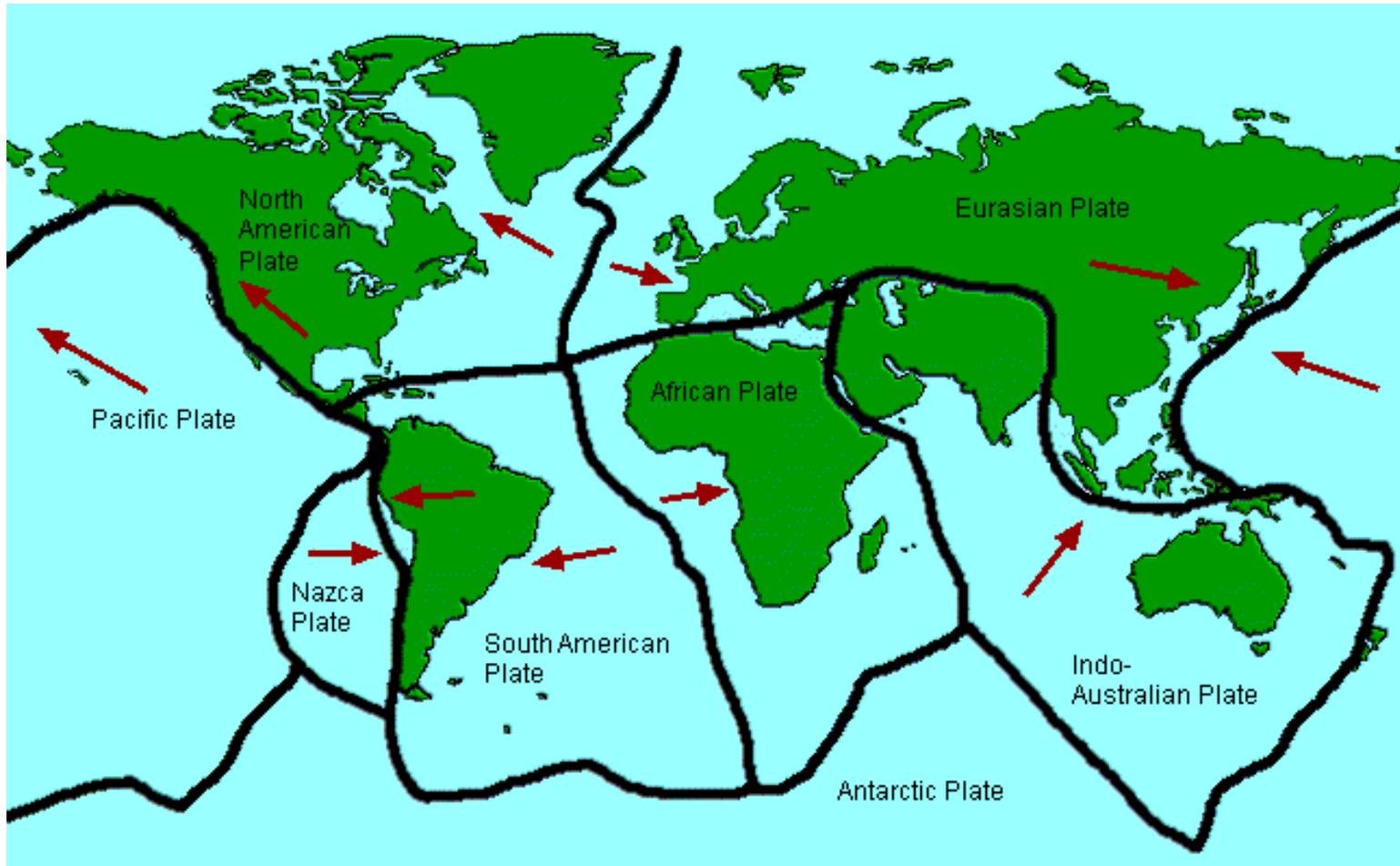
**How They
Move**

Lithosphere: Sphere of Rock



- rigid outer layer
- made of **crust** and the **uppermost** part of the **mantle**
- broken into pieces called **tectonic plates**
- eight major tectonic plates (plus several minor)

Major Tectonic Plates



All tectonic plates **move** in different directions 1-2 inches per year.

How do Plates Move?

- The driving forces of plate motion is **an active subject of on-going research** within geophysics.
- Leading theory: plates of lithosphere are moved around by **convection in the underlying hot mantle**.

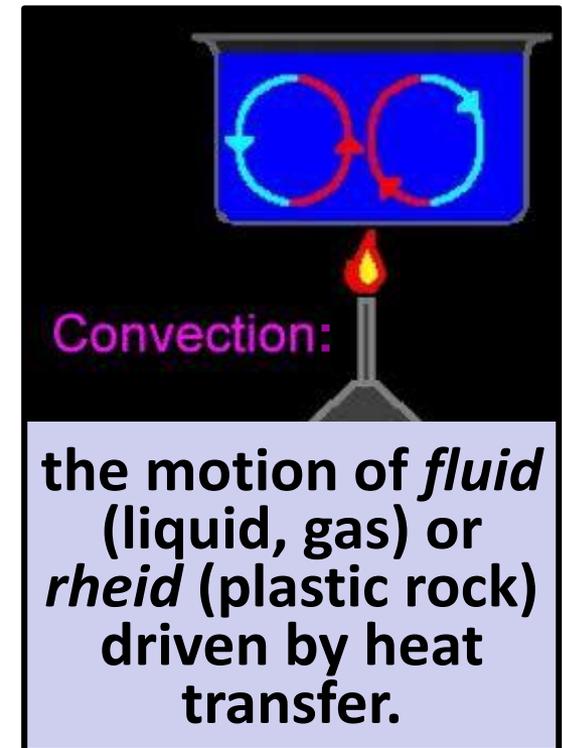
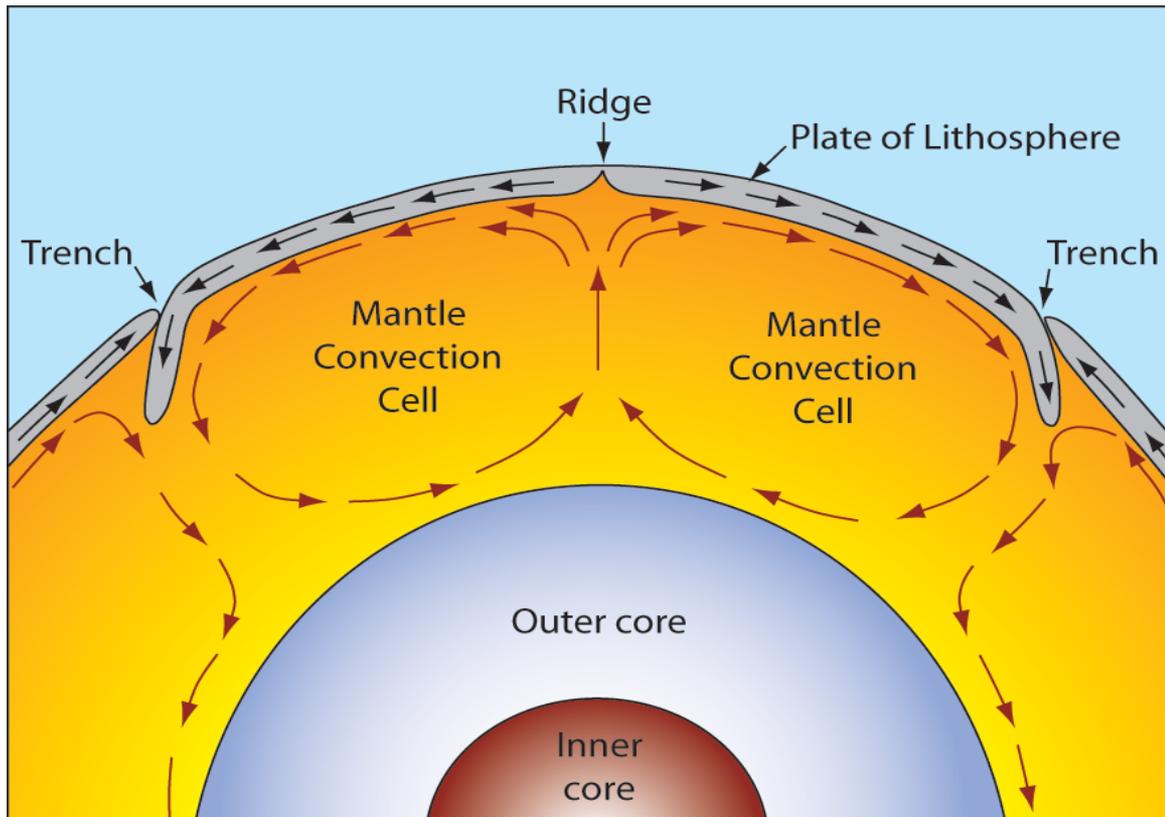
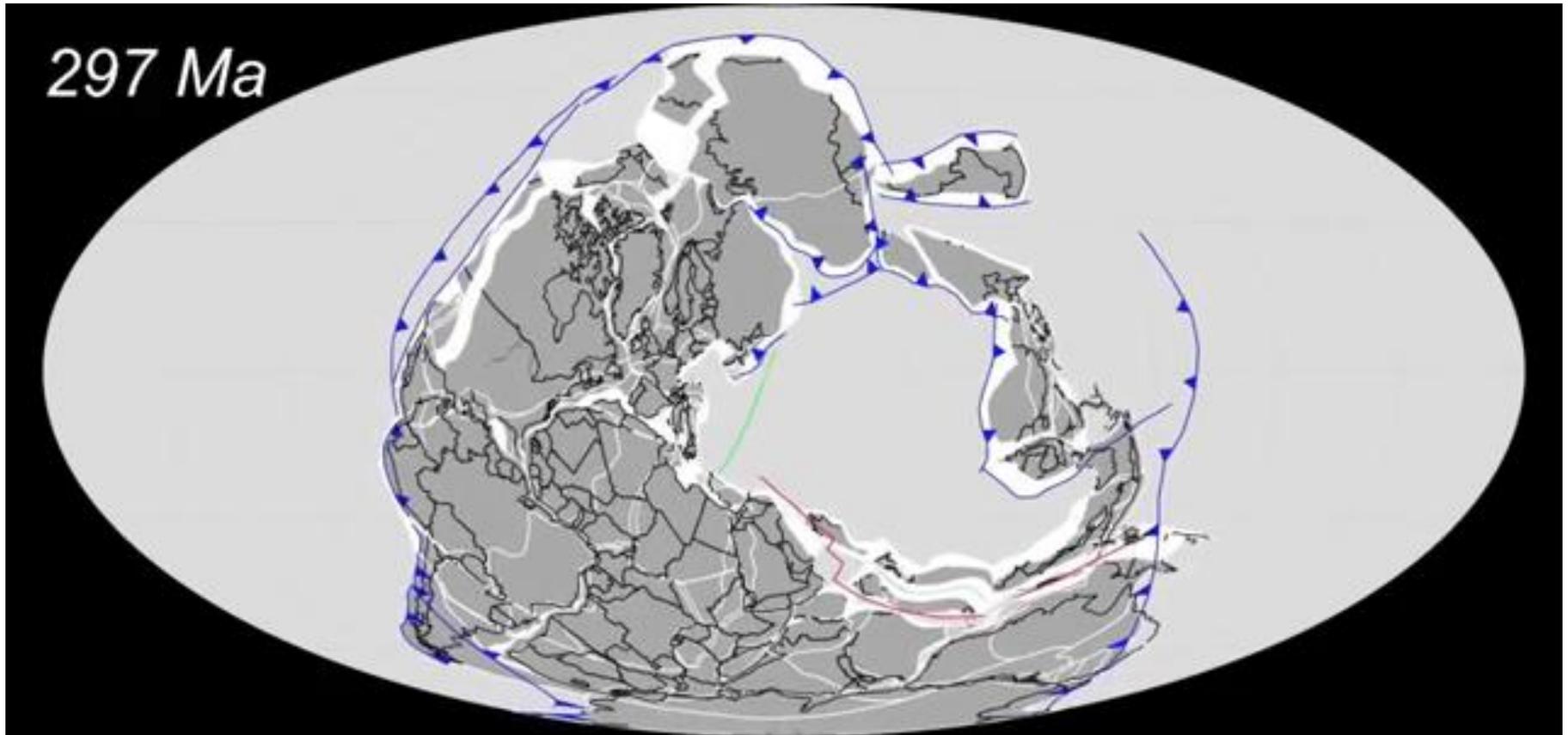


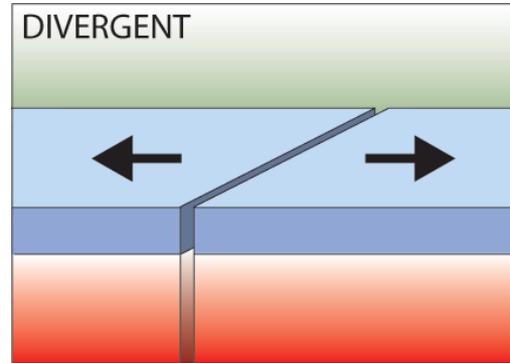
Plate Movement Simulation (past 300 million years)



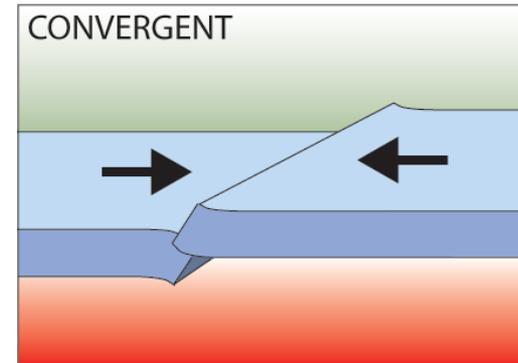
<https://www.youtube.com/watch?v=llnwyAbczog>

Three types of plate boundary

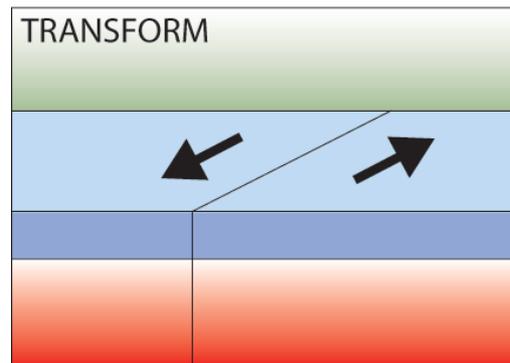
- **Divergent**



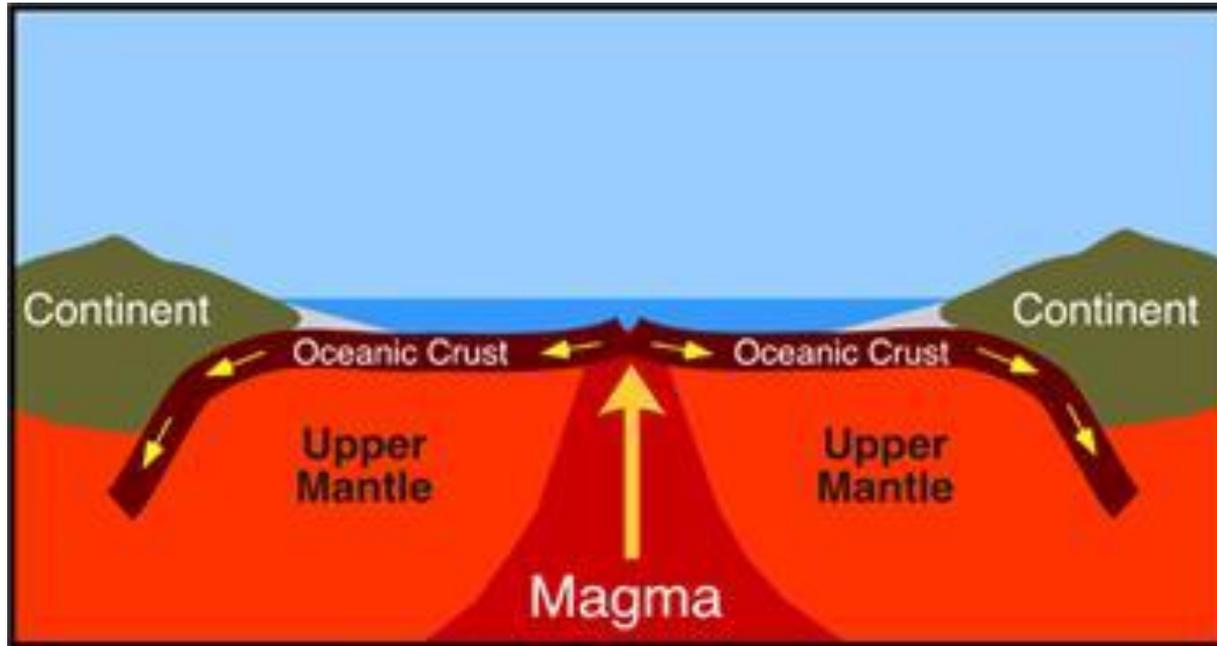
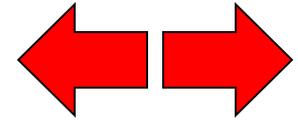
- **Convergent**



- **Transform**



Divergent Boundaries

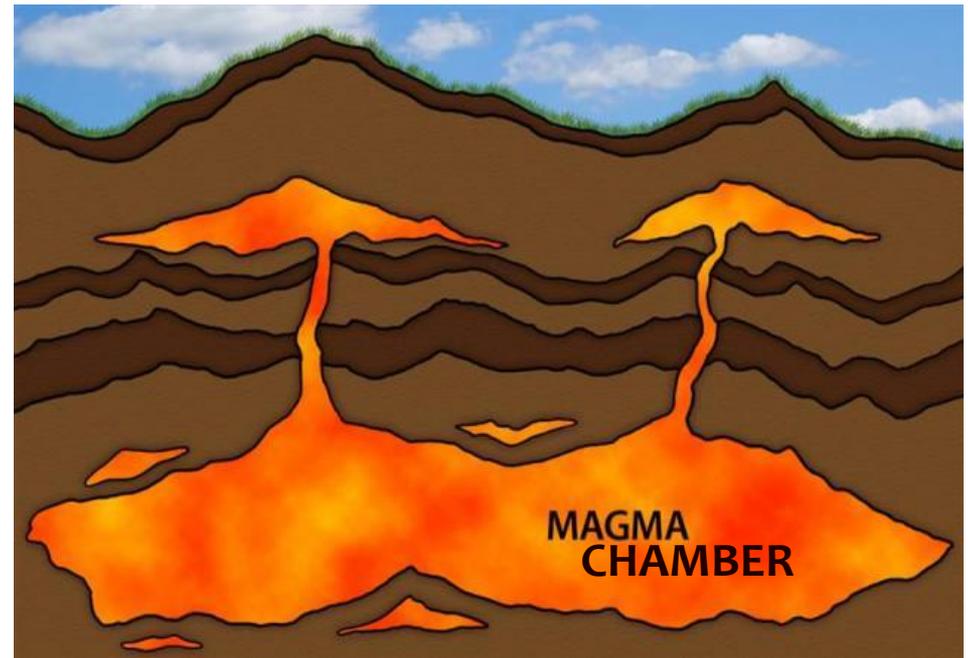
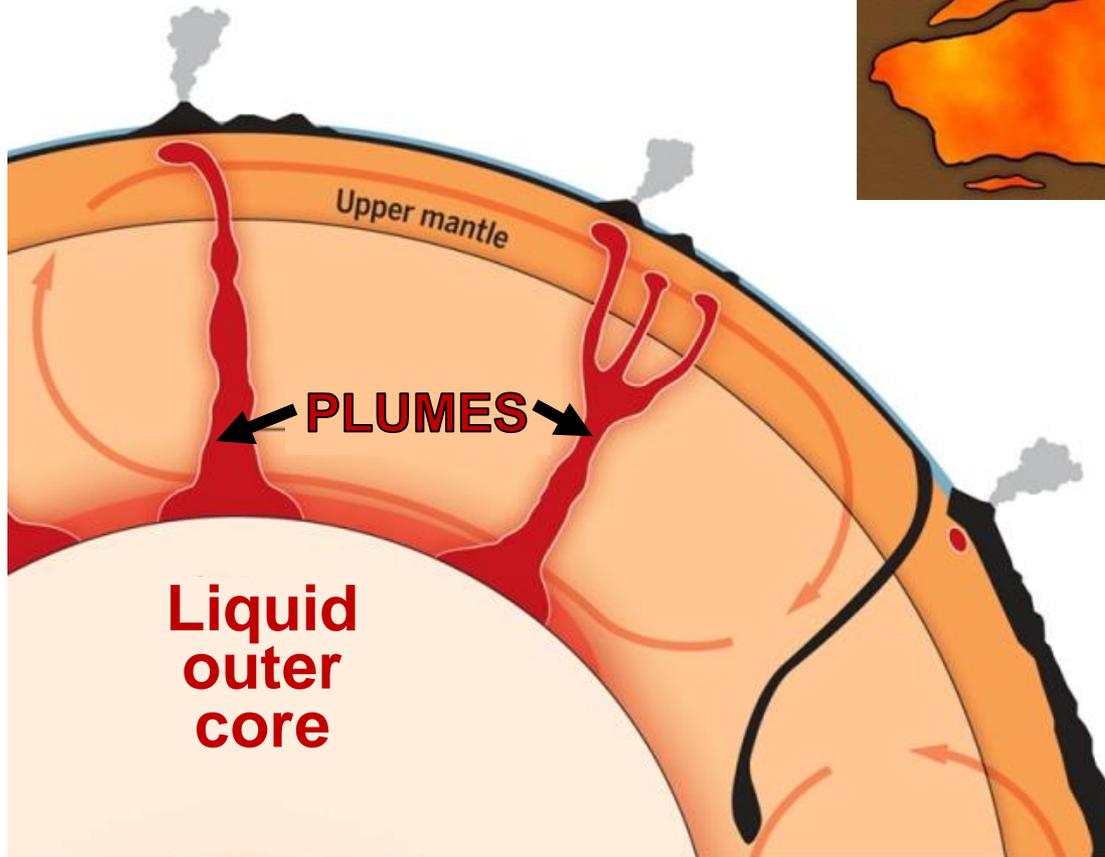


- **Spreading ridges:**
 - as plates **move apart**, new material is **erupted** to fill the gap
 - young crust is formed

What is magma and where does it come from?

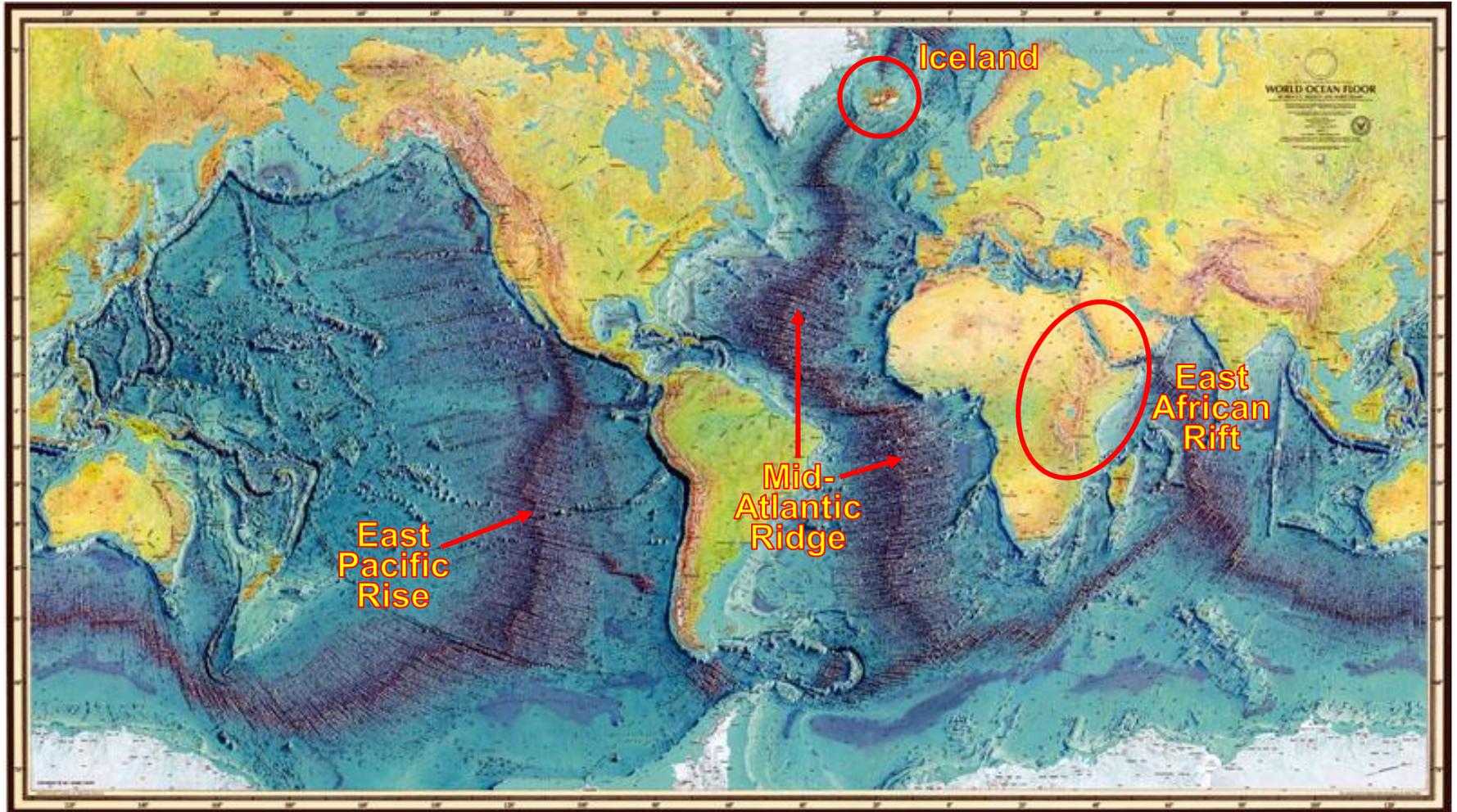
Magma

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



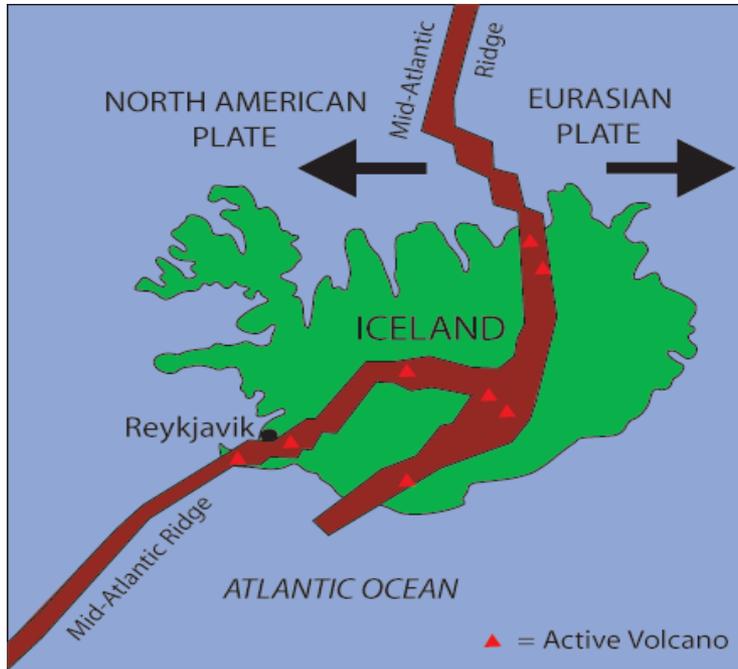
- Develops and collects in **magma chambers** usually within several miles of the Earth's surface.
- May also rise in **mantle plumes** directly from the outer core/mantle boundary.

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

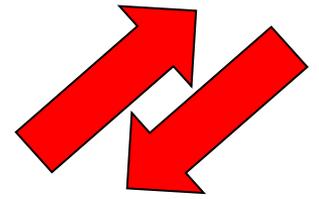


Iceland has a ***divergent plate boundary*** running through its middle.

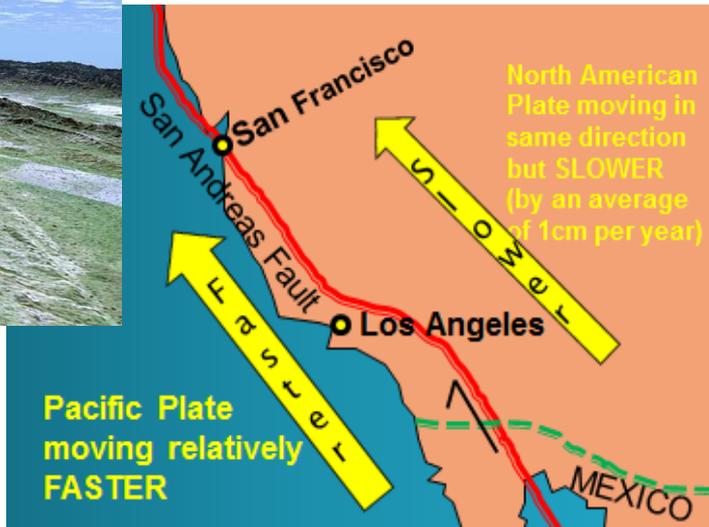
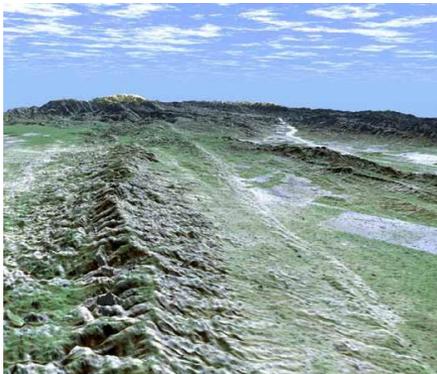
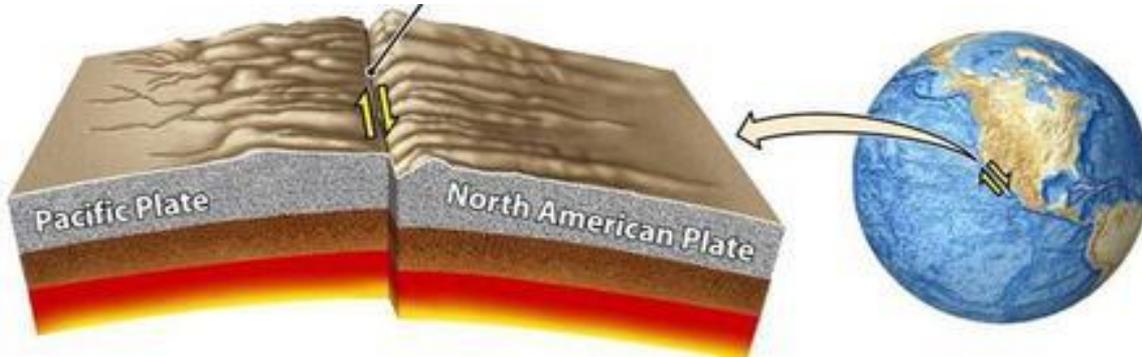
In fact, the island exists because of this feature!



Transform Boundaries



- Plates slide past each other



San Andreas Transform Fault