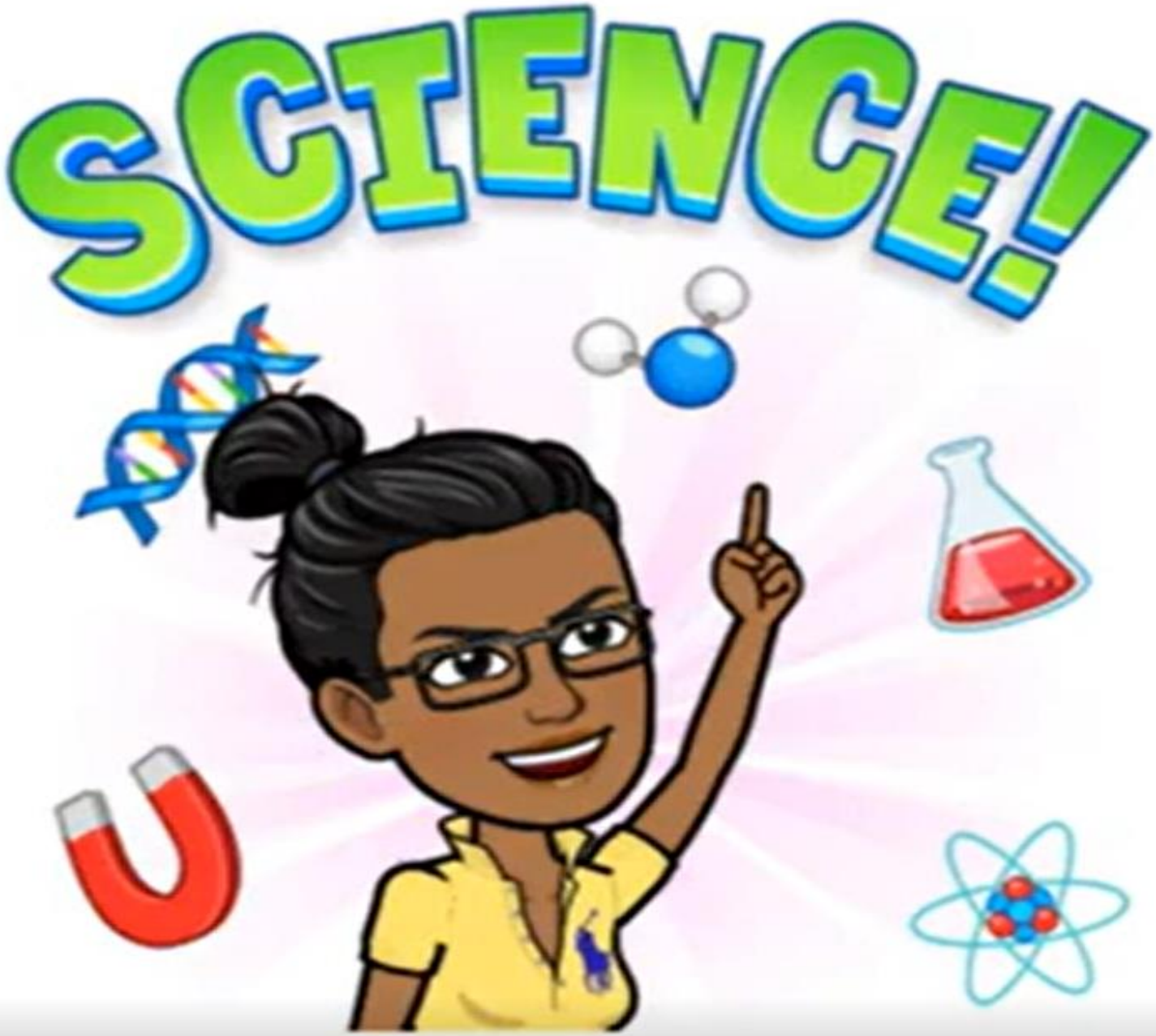

SCIENCE!

- DIFFERENT PROCESSES

AND GEOLOGIC FEATURES ALONG PLATE BOUNDARIES

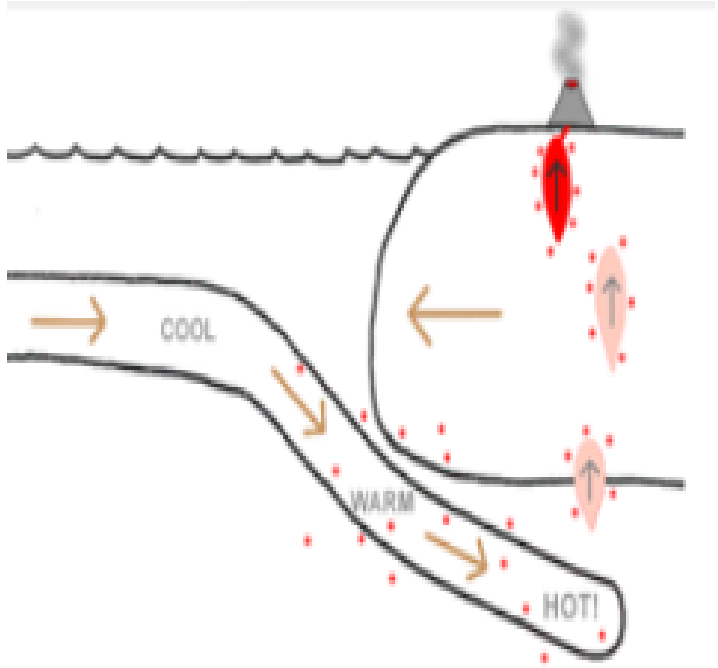
EARTH'S SURFACE

a giant jigsaw puzzle because its outer surface is composed of about 20 tectonic plates with enormous sections that roughly fit together and meet at places called **plate boundaries**.

- Plate boundaries are important since they are often associated with earthquakes and volcanoes.

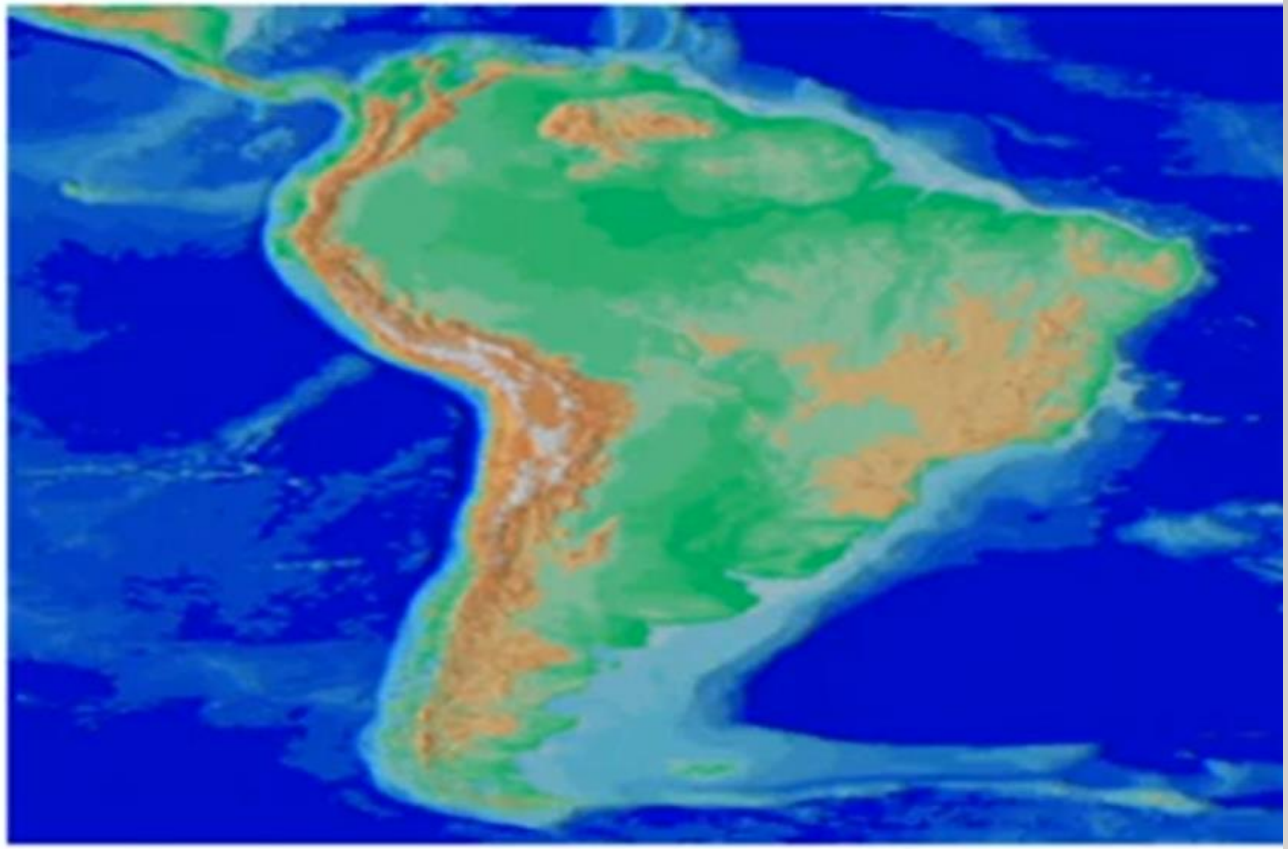
- Earthquakes-enormous amount of energy released when plates grind to each other.
- Volcanoes- molten rock from deep within the Earth can travel upward at these intersections between each plate.

Convergent Plate Boundary



When continental and oceanic plates collide, the thinner and denser oceanic plate is overridden by the thicker and less dense continental plate. The oceanic plate is forced down into the mantle in a process known as "subduction." As the oceanic plate descends, it is forced into higher temperature environments. At a depth of about 100 miles (160 km), materials in the subducting plate begin to approach their melting temperatures and a process of partial melting begins.

The collision of two of these plates – the oceanic Nazca Plate and the continental South American Plate– resulted in the orogenic activity that produced the Andes Mountains.



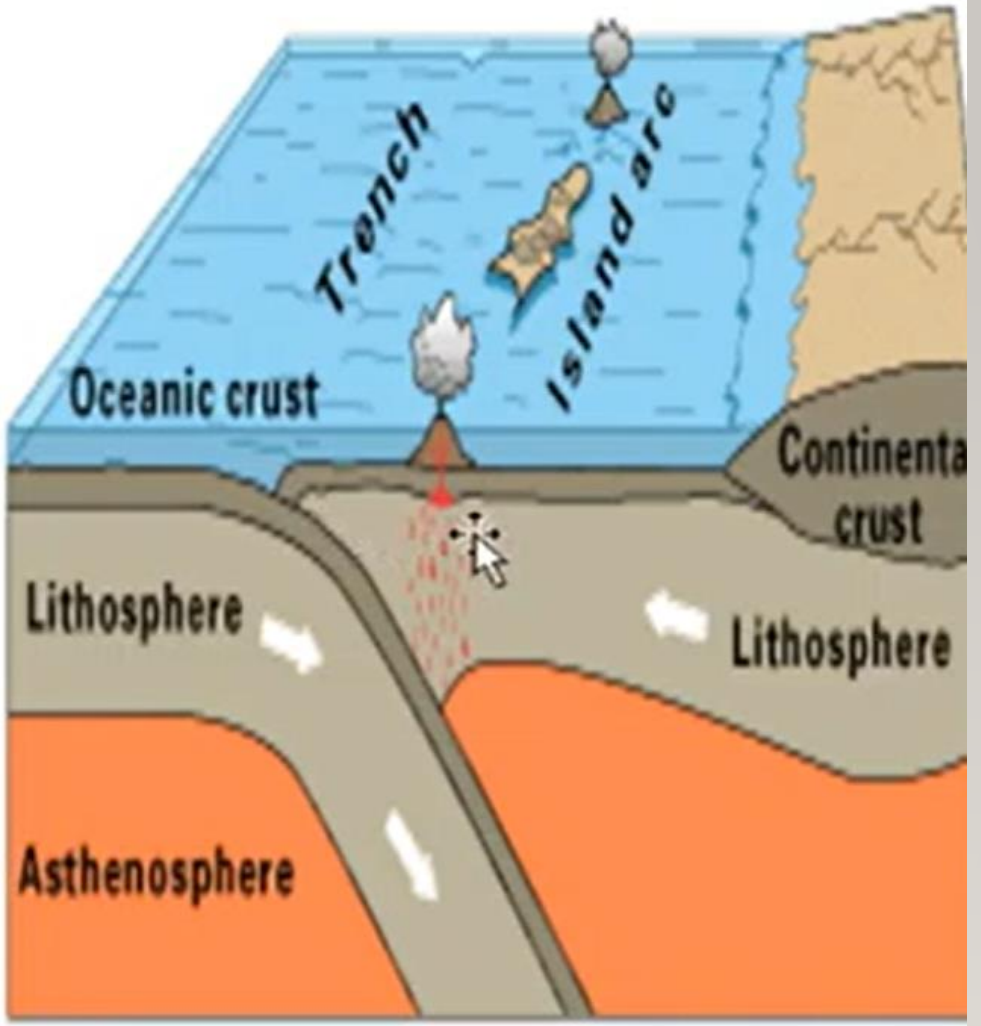
Andes Mountain ranges-world's longest mountain range (cuts across seven countries in South America)

The Andes Mountains are volcanic. While some are dormant volcanoes, others are active and have the potential to erupt at any moment. Not just a single chain of mountains. Instead, they are composed of a number of parallel chains that connect, from pla to place, in orographic rows or detach from one another, creating high plateaus between them.

- What happens when two oceanic plates collide?

Two oceanic plates

- One of those plates will subduct beneath the other- (older and denser)
- The subducting plate is heated as it is forced deeper into the mantle, and at a depth of about 100 miles (150 km) the plate begins to melt.
- **Magma chambers** are produced as a result of this melting, and the magma is lower in density than the surrounding rock material. It begins ascending by melting and fracturing its way through the overlying rock material. Magma chambers that reach the surface break through to form a **volcanic eruption cone**.
- Early stages of this type of boundary, the cones will be deep beneath the ocean surface but later grow to be higher than sea level. This produces an **island chain**. With continued development the islands grow larger, merge, and an **elongate landmass** is created.



Oceanic-oceanic convergence

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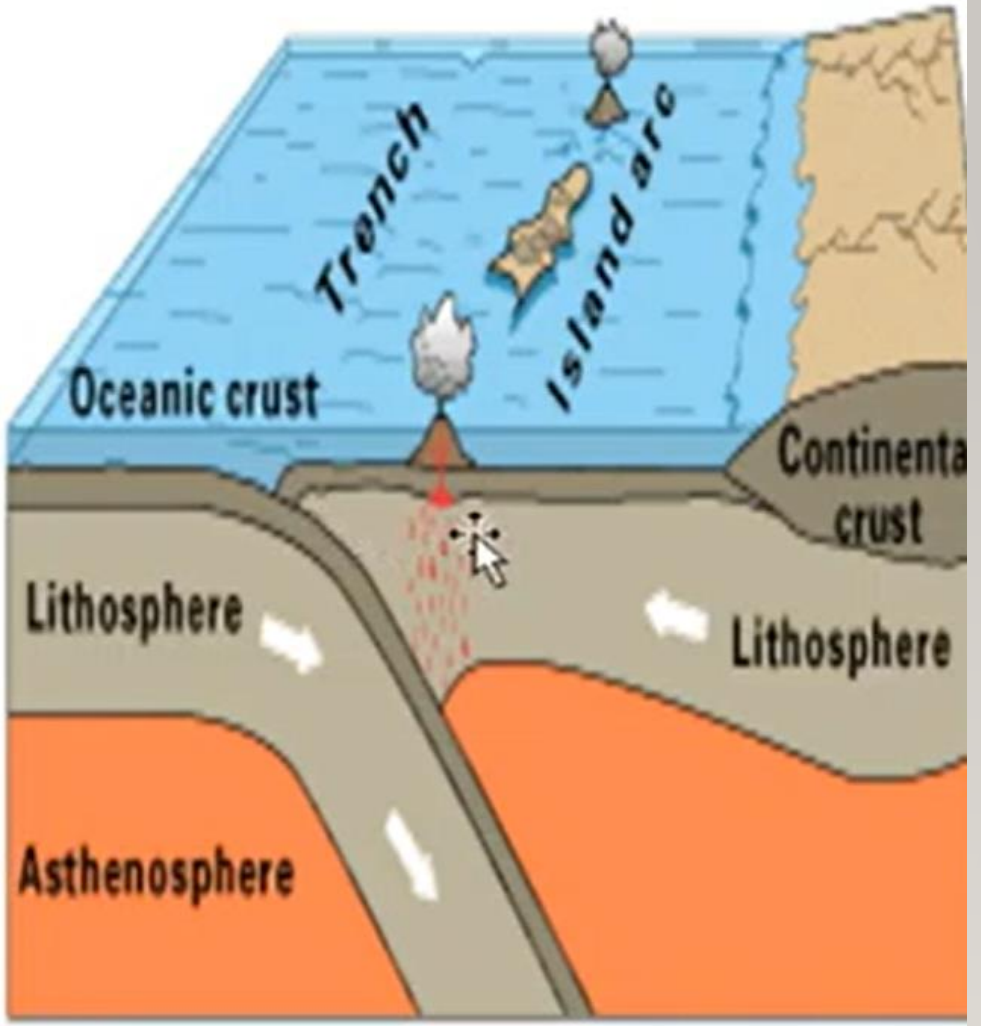


Oceanic-oceanic convergence

The Aleutian Islands arcs and Aleutian Trench as product of two converging oceanic plates

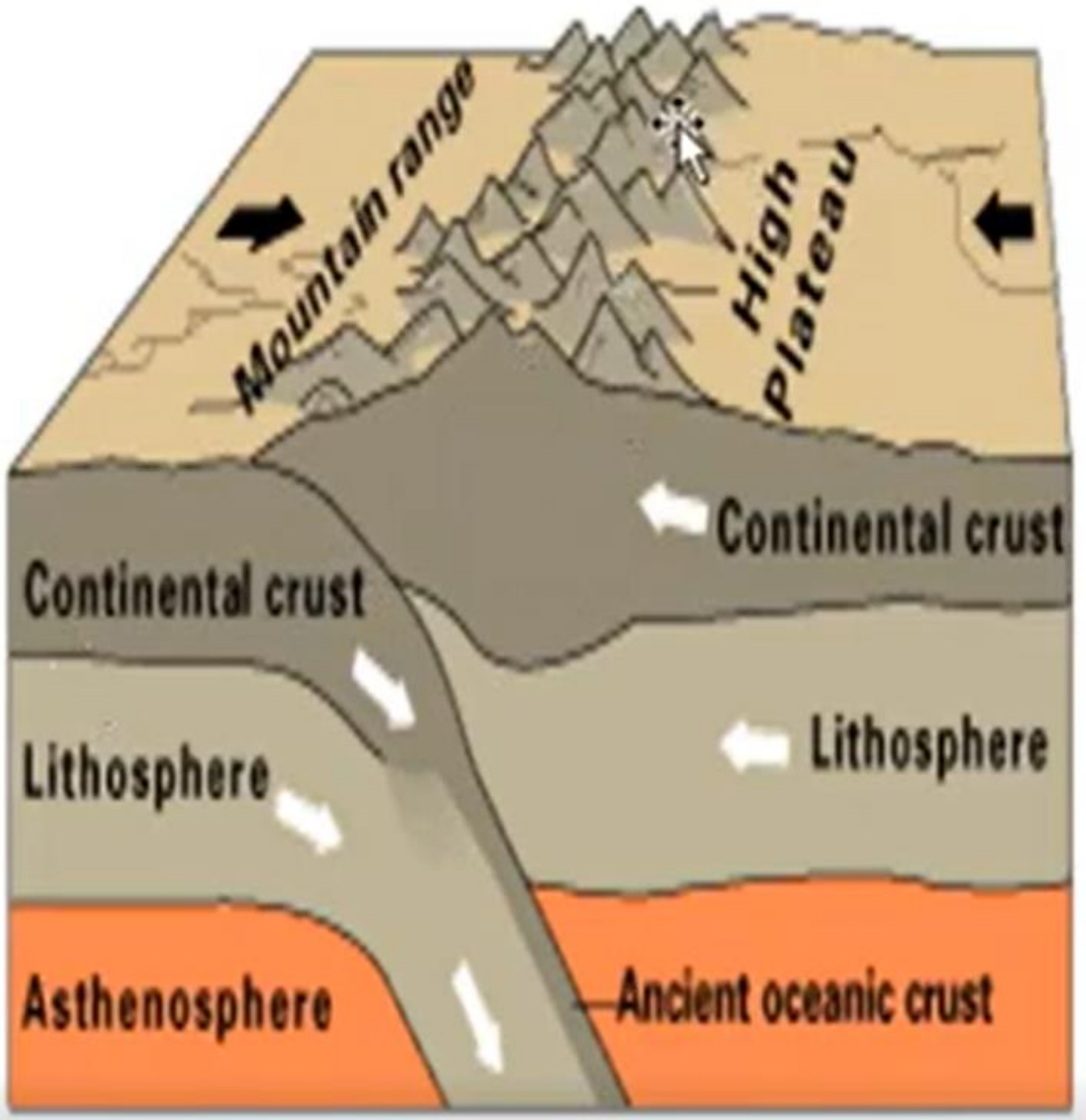
They are a chain of 14 large volcanic islands and 55 smaller islands, formed in the Early Eocene (55–50 Ma) when the subductio of the Pacific Plate under the North American Plate began

Convergence of Two Continental Plates

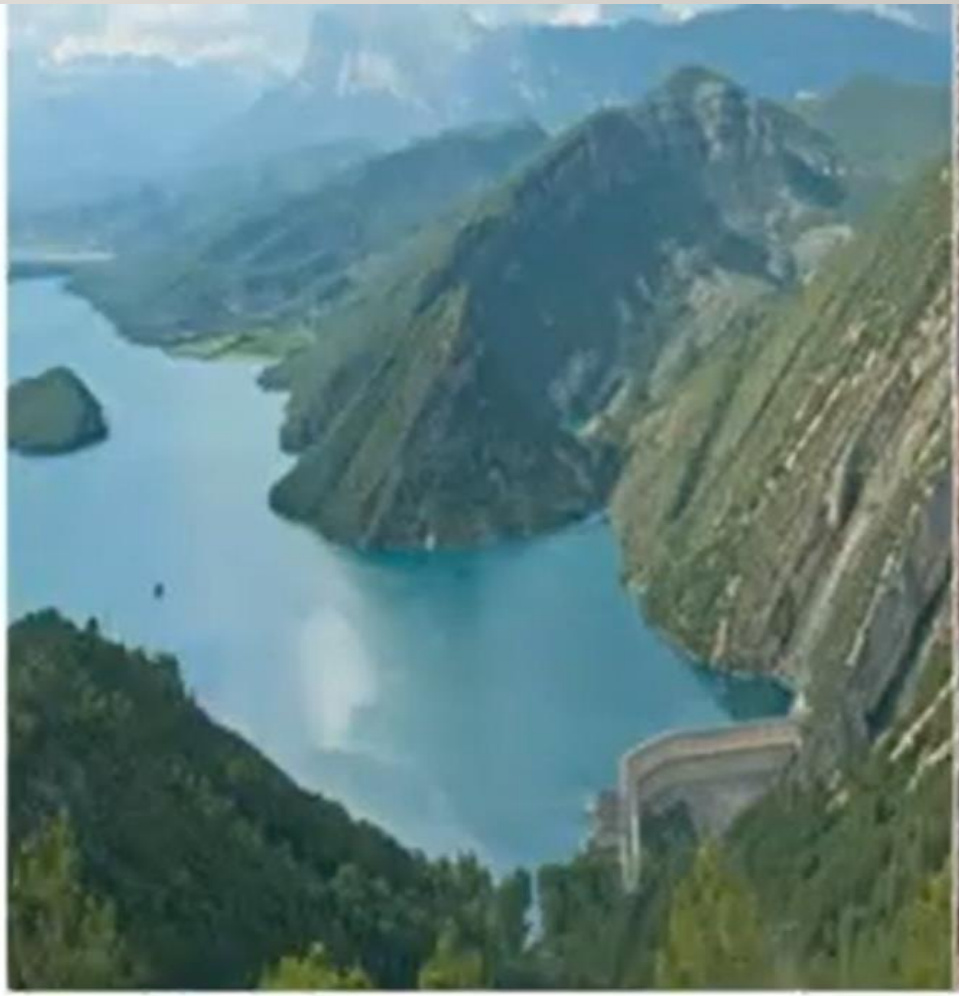
A continental plate colliding with another continental plate

Have Collision Zones:

a place where folded and thrust faulted mountains form.

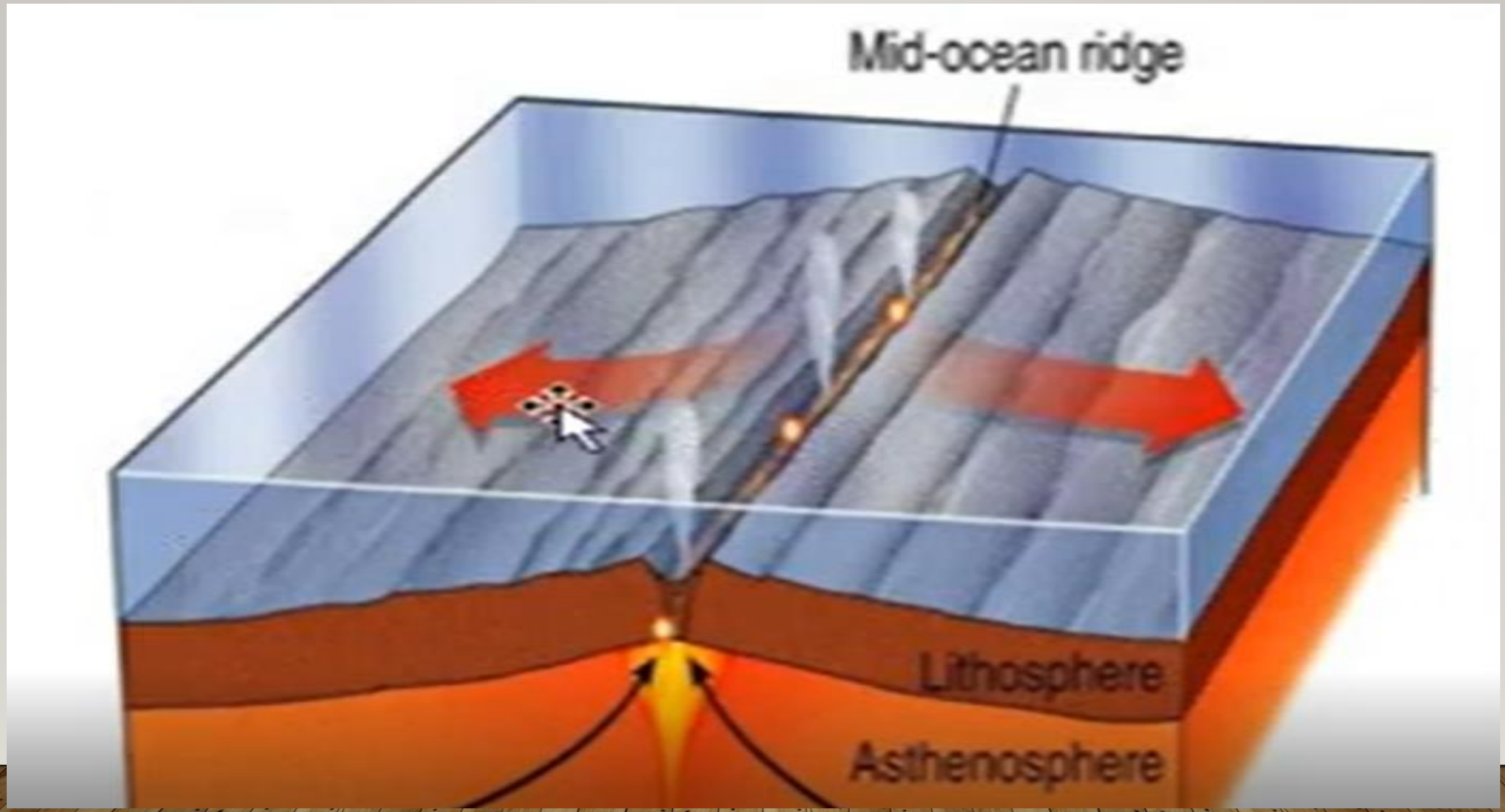


Continental-continental convergence



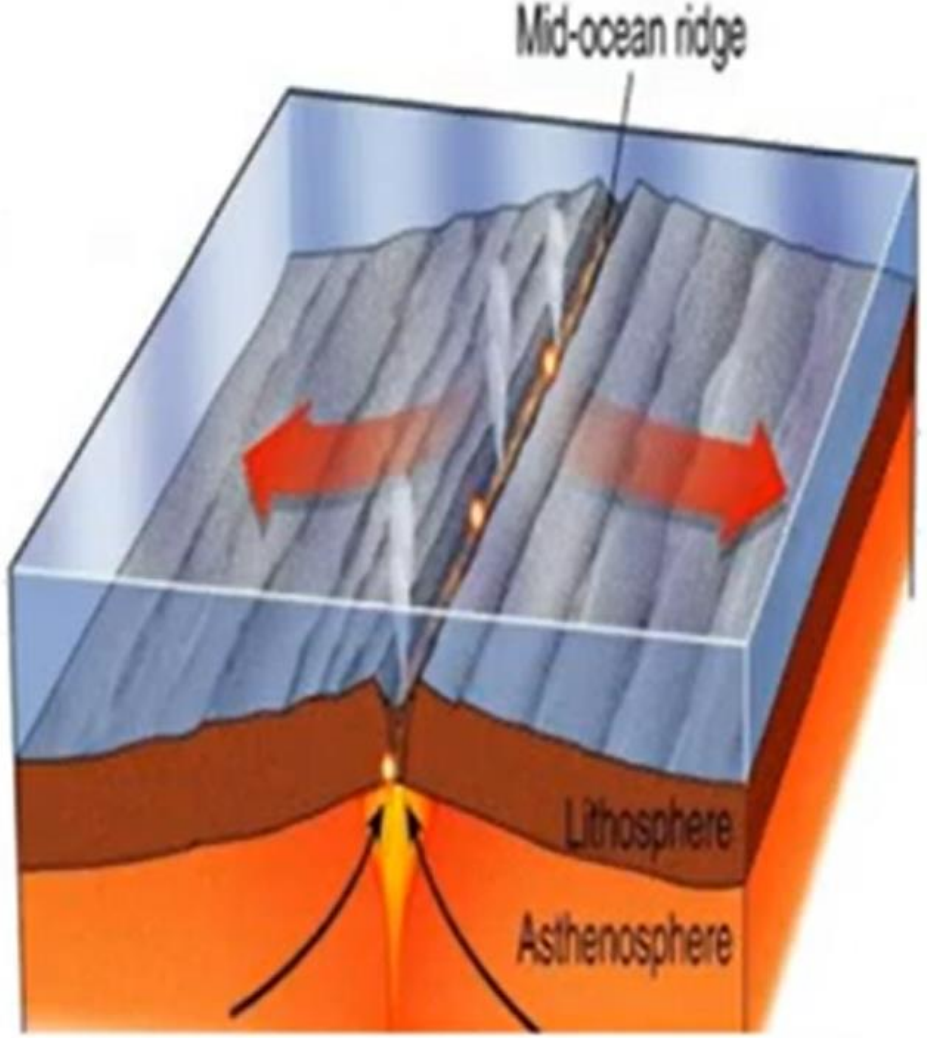
Examples of Folded and Thrust-Folded Mountains

- How about the geologic processes in the divergent boundary?


Mid-ocean ridge
Lithosphere
Asthenosphere

Geologic Features and Processes that resulted from Divergent Plate Boundaries

- When a divergent boundary occurs beneath oceanic lithosphere, the rising convection current below lifts the lithosphere, producing a mid-ocean ridge. Extensional forces stretch the lithosphere and produce a deep fissure.
- When the fissure opens, pressure is reduced on the super-heated mantle material below. It responds by melting, and the new magma flows into the fissure. The magma then solidifies and the process repeats itself.



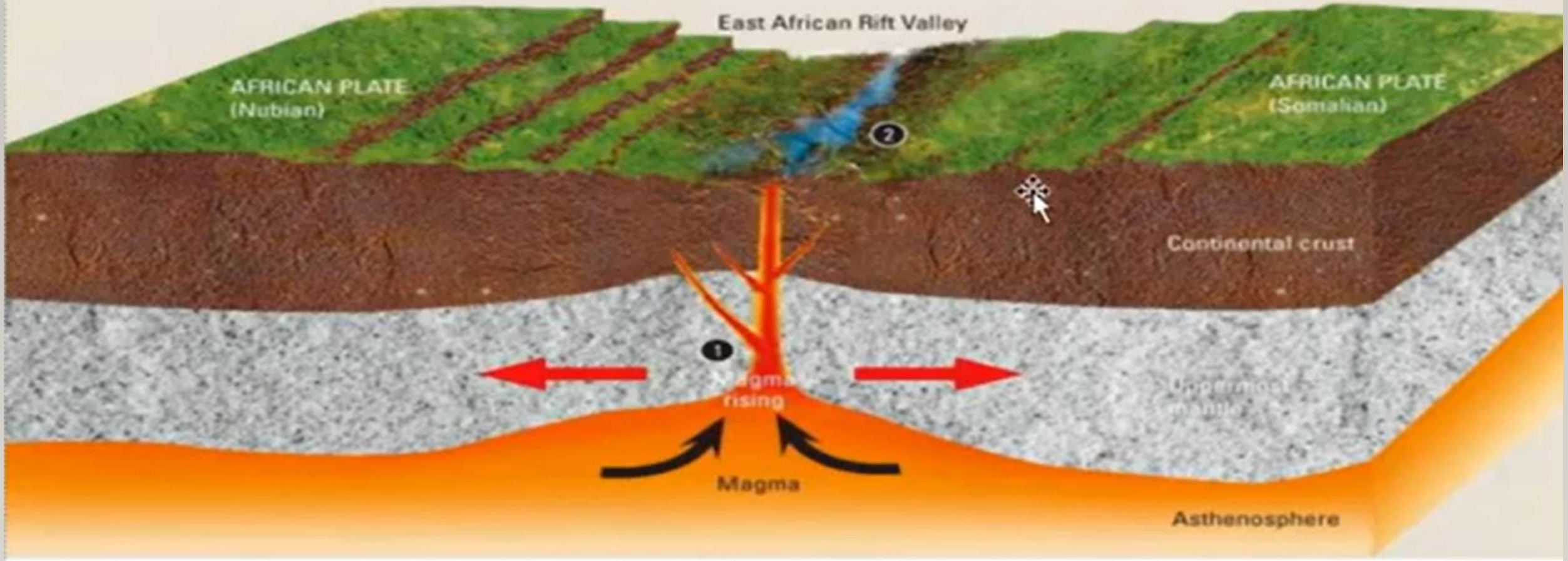
Mid-Atlantic Oceanic Ridge, Iceland

In summer the clear waters are warmer, so the combination of a nice weather with snorkelling between Eurasian and American continent can become one of the best memories.

- How about if two continental plates diverging or move from each other what will be formed?

causing fractures to form at the plate boundary.

a linear depression known as a rift valley.



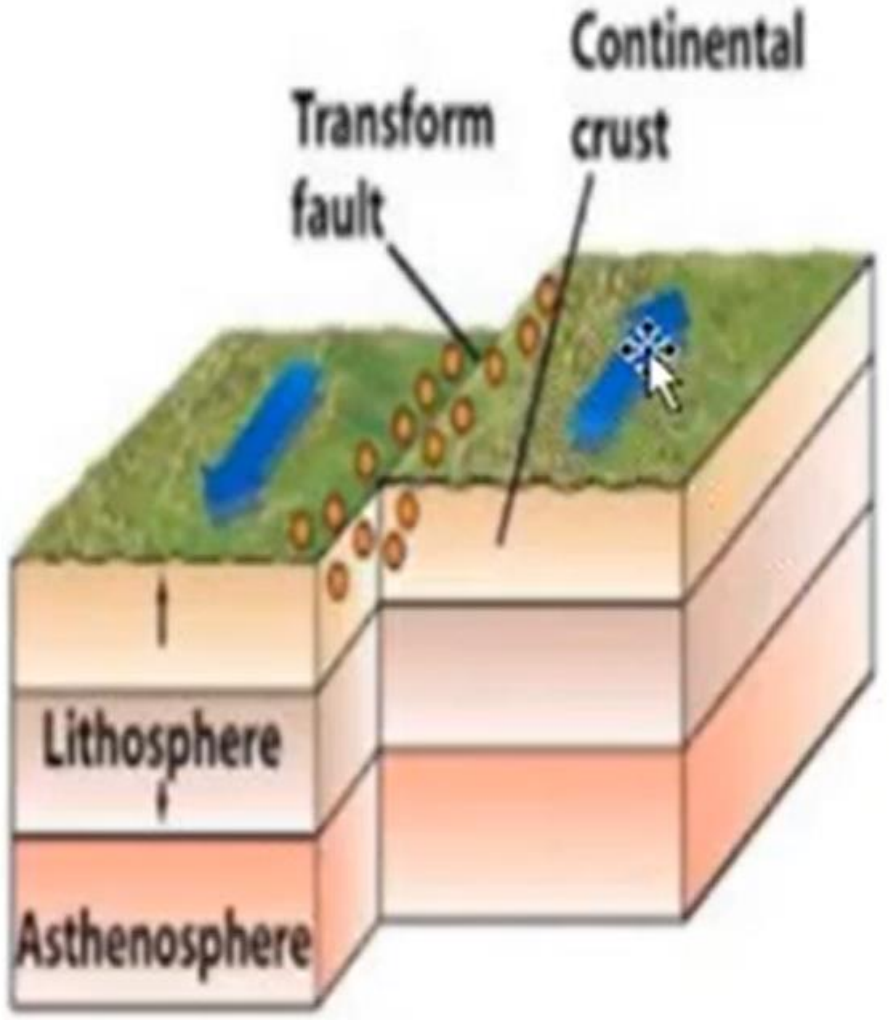
The East African Rift Valley is A narrow zone, the rift is a developing divergent tectonic plate boundary where the African Plate is in the process of splitting into two tectonic plates, called the Somali Plate and the Nubian Plate, at a rate of 6–7 mm (0.24–0.28 in) per year.

Features of Divergent Boundaries

- Mid-ocean ridges
- rift valleys
- fissure volcanoes
- Earthquakes

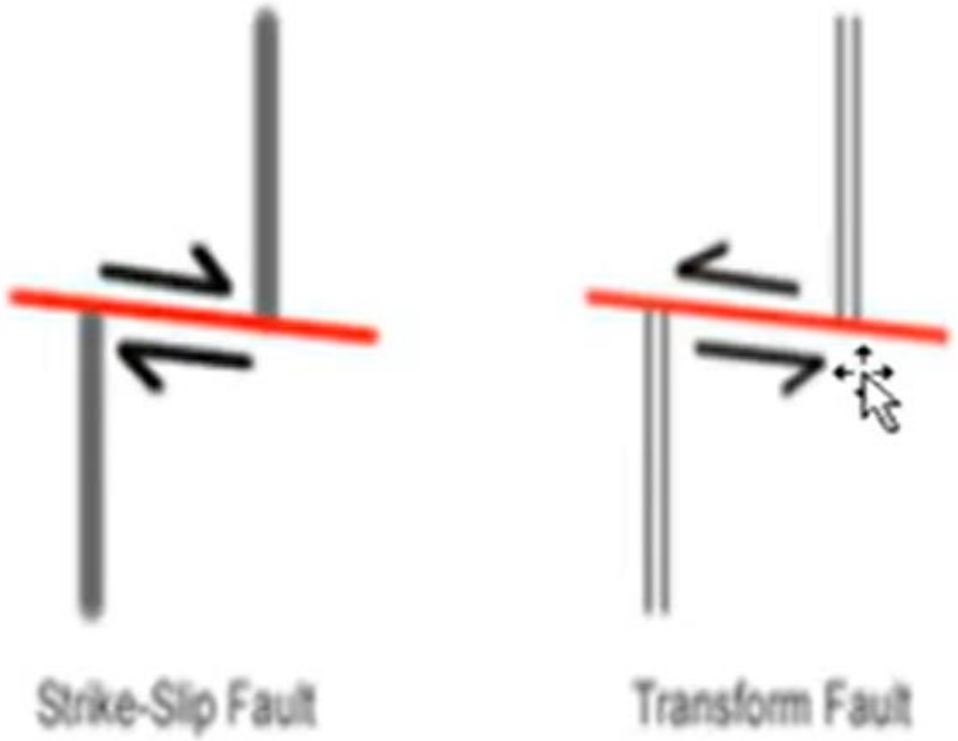
Transform Plate Boundary

- Transform Plate Boundaries are locations where two plates slide past one another. The fracture zone that forms a transform plate boundary is known as a transform fault. Most transform faults are found in the ocean basin and connect offsets in the mid-ocean ridges. A smaller number connect mid-ocean ridges and subduction zones.
- EARTHQUAKES along faults



How do plate boundaries become transform fault?

- Transform faults can be distinguished from the typical strike-slip faults because the sense of movement is in the opposite direction (see illustration). A strike-slip fault is a simple offset; however, a transform fault is formed between two different plates, each moving away from the spreading center of a divergent plate boundary. When you look at the transform fault diagram, imagine the double line as a divergent plate boundary and visualize which way the diverging plates would be moving.



Learning Task

Answer these questions:

1. What process occurs along divergent plate boundary?
2. What geologic features formed when two plates moved away from each other?
3. Compare rift valley from mid-ocean ridge. Explain your answer.

Answer these questions:

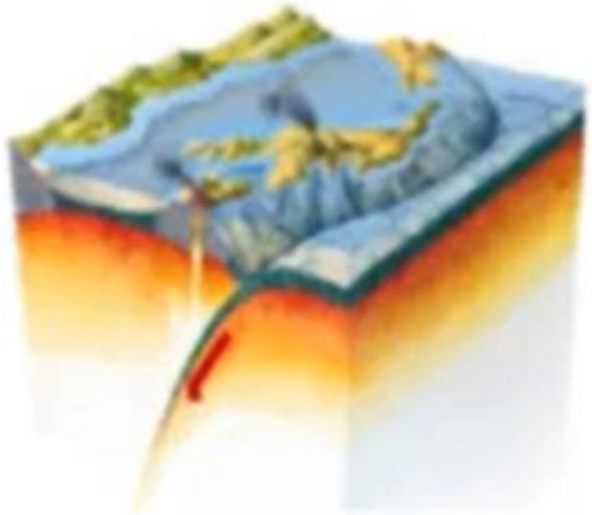
Questions:

1. What process occurs along transform fault plate boundary?
2. How do plate boundaries become transform fault?

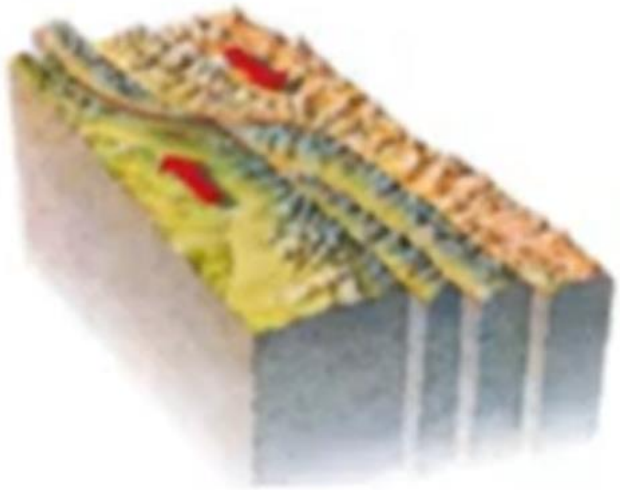
Learning Task 2 : Study the pictures and group of words below. Use the words to explain the processes that occur in each picture. Write your answer in your notebook.

Subduction	Mountain ranges	Volcanic arc	Rift valley
Fault	Mid-ocean ridge	Fissures	Fracture zone
Magma chamber	Collision	Spreading	Trench
Slip			

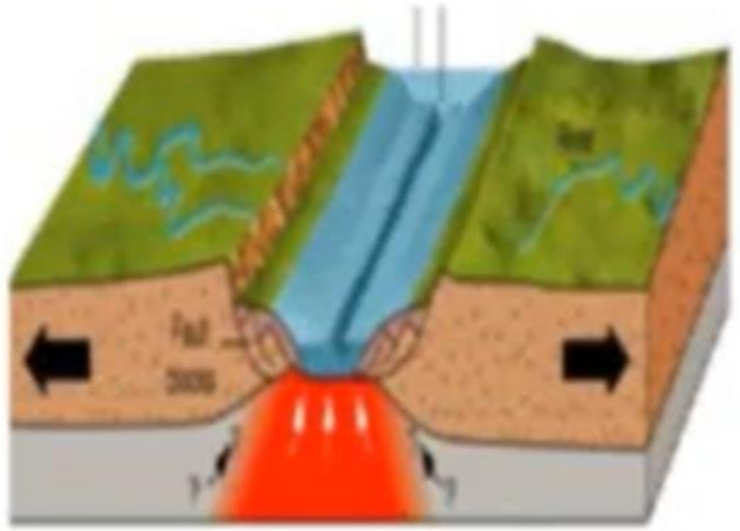
A.



B.



C.



Learning Task 3: Explain the processes along plate boundaries thru the use of a graphic organizer below. Write your answer in your notebook.