GRADE 10	TERM 2	SOCIAL SCIENCES (GEOGRAPHY) GEOMORPHOLOGY UNIT 2: PLATE TECTONICS - MEMO

LEARNING OUTCOMES:

- Changes in the position of continents over time
- Evidence for the movement of continents over time
- Plate-tectonics – an explanation for the movement of continents
- Mechanics of plate movements
- Processes and landforms associated with different kinds of plate boundaries
- The World's volcanic and earthquake zones

ACTIVITY 1: CONTINENTAL DRIFT

1. Name the current continents that were part of the landmass known as Laurasia.
   North America, Europe and Asia (excl. India)
2. Name the current continents that were part of the landmass known as Gondwana.
   South America, Africa, India, Antarctica and Oceania
3. In point form, summarise the evidence that suggests continental drift occurred.
   Wegener's evidence for continental drift was that:
   - ***The same types of fossilised animals and plants are found in South America and Africa***
   - ***The shape of the east coast of South America fits the west coast of Africa, like pieces in a jigsaw puzzle***
   - ***Matching rock formations and mountain chains are found in South America and Africa***
   - ***Coal was found in Antarctica***
   - ***Mid-ocean rocks relatively young and get older as you move towards the continents. This indicates sea floor spreading.***
   - ***Matching striations on different continents***
4. Explain how igneous rocks can act as a sort of "metal compass" to support the theory of continental drift.
   Only two minerals on Earth are magnetic. They both have high quantities of iron. Magnetite is one of the magnetic minerals and pyrrhotite is the other. Magnetite was used by ancient sailors for compasses. They would chip off needles of magnetite and float them on water and watch the needle point to the north.

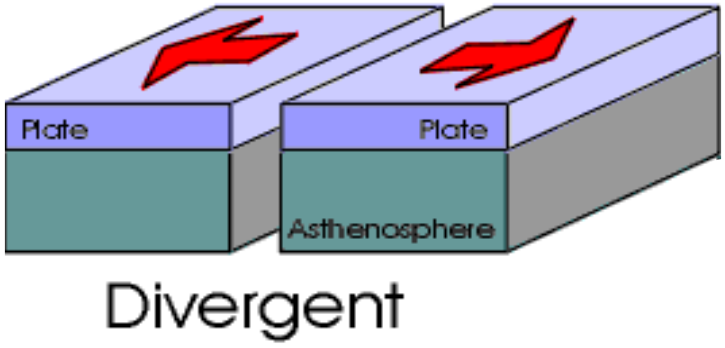
ACTIVITY 2

1. In your own words, summarise how convection currents occur in the mantle.
   Magma is hottest nearest the Earth's core and rises, as it rises it cools and starts to sink.

TYPES OF PLATE BOUNDARIES

A. Divergent Plate Boundary

Diagram of a divergent plate boundary



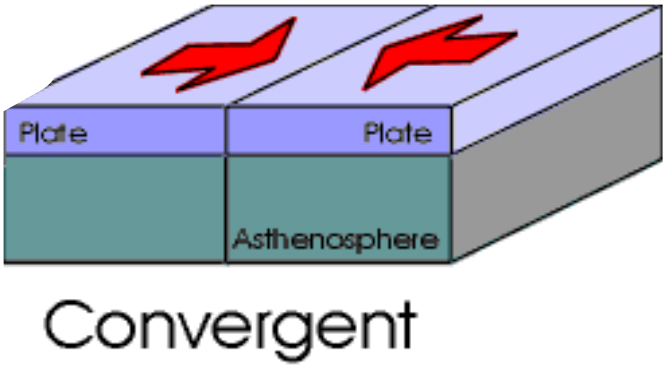
When plates DIVERGE (move apart) allowing a fresh upwelling of magma, that cools and creates new crust. Often gives rise to earthquakes and volcanoes. These boundaries are also known as "divergent".

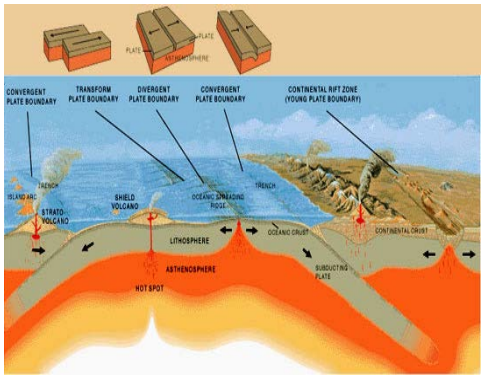
ACTIVITY 3

1. Explain why new crust is created along divergent plate boundaries?
   New crust is created along these boundaries as the plates are moving apart and so magma is allowed to spill onto the Earth's surface and solidify, thus creating new land.
2. What type of landform do you think is most commonly found along divergent boundaries?
   Ridges are created.

B. Convergent Plate Boundary

Diagram showing an oceanic plate and continental plate colliding.

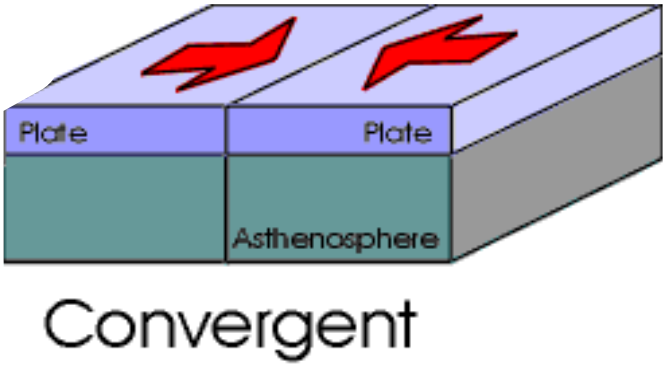


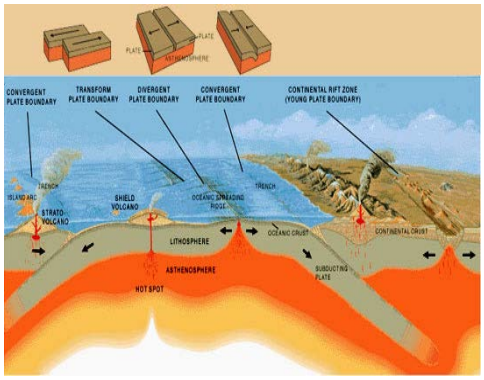


When plates CONVERGE (move together) the heavier oceanic plate is forced underneath the lighter continental plate. This forms a trench in the ocean. On the land, this compression causes fold mountains to form. These areas often gives rise to earthquakes and volcanoes.

When two continental plates collide neither can slip, or subside, under the other so they are forced to collide and rise creating very large mountain ranges.

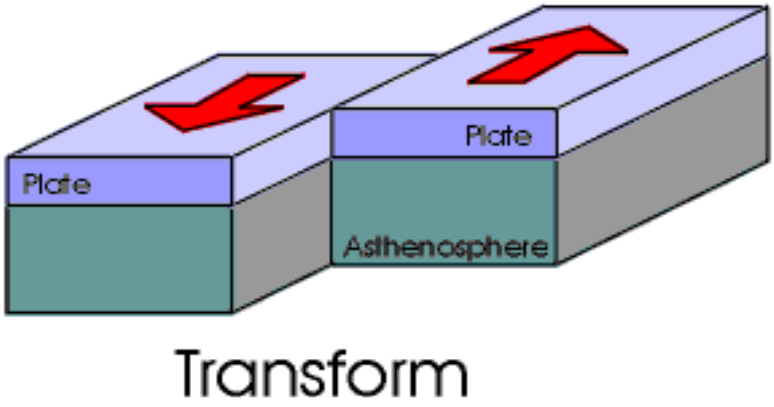
Diagram illustrating two continental plates colliding.





C. Transform Boundaries

Diagram illustrating a transform plate boundary.



- ***At a conservative boundary the plates are sliding horizontally past each other. No land is created at a conservative boundary and none is destroyed.***
- ***Volcanoes do not occur along these boundaries but earthquakes are very common. A very well-known example of a conservative boundary is the San Andreas Fault, which runs through the state of California in the USA.***

ACTIVITY 3

1. Give the names of TWO places in the world where the following plate boundaries could occur?

   a. A transform plate boundary:
   A transform plate boundary:
   San Andreas Fault (North America)
   Middle East's Dead Sea Transform
   Pakistan's Chaman Fault
   Turkey's North Anatolian Fault
   North America's Queen Charlotte Fault

   b. A divergent plate boundary:
   A divergent plate boundary:
   Red Sea Rift
   East African Rift
   Gakkel Ridge
   Galapagos Rise
   Great Rift Valley

   c. A convergent plate boundary:
   A convergent plate boundary:
   Himalayas
   Southern Alps (New Zealand)
   Andes (South America)
   Aleutian Islands (near North America)
   Pontic Mountains (Turkey)

2. Explain why volcanoes and earthquakes are often found along the edges of convergent plate boundaries between oceanic and continental plate boundaries.
   Earthquakes occur as the plates pull away from each other. Volcanoes also form as magma rises upward from the underlying mantle along the gap between two plates. Earthquakes occur because of the interaction between plates. When rock from the mantle melts and moves to the surface through the crust, this is when volcanoes occur.