

**Bukit Batok Secondary
Geography**

Name: _____()

Class: _____

Date: _____

Explanation of Tectonic Processes

Magnetic Striping as evidence to support plate tectonic theory:

- Iron rich lava containing magnetic materials erupt from centre of the ridge.
- These materials cool & solidify to form rocks eg basalt that can be influenced by Earth's magnetic field, point towards magnetic north, corresponding with Geographic North (normal polarity)
- As the seafloor spreads, older crustal rocks pushed further from ridge, & when influenced by changing Earth's magnetic field, points towards magnetic south, corresponding to Geographic North (reversed polarity)
- Zebra-like symmetrical pattern with normal polarity rocks alternating with reversed polarity rocks forms on either side of ridge

What causes plates to move?

Convection current

- Heat from the earth's core causes the mantle material to become less dense.
- Mantle material rises towards the surface.
- The rising convection currents then spread beneath the plates and drag them apart, causing divergent plate movement.
- The mantle material then loses heat and sinks towards the core.
- Convergent plate movement occurs where the convection currents collide.
- The materials then get heated up again and the process repeats.
- The rising and sinking of the mantle materials forms convection currents.

Oceanic-Oceanic Divergence:

- Two oceanic plates move apart.
- As the plates move apart, parts of the underlying mantle melts, forming magma. Magma rises through weak areas in the crust to the Earth's surface, to erupt as lava. The lava cools, solidifies and forms a new oceanic crust. As successive eruptions occur, lava accumulates overtime to form undersea volcanoes, which are known as oceanic ridges.
- As plates continue to move apart, rocks at the oceanic ridge fracture to form parallel faults.
- Rocks between these faults subsides to form deep elongated rift valley with steep sides within the oceanic ridge.
- Overtime, the undersea volcanoes may break the surface of the ocean to form volcanic islands.

Continental-Continental Divergence:

- Two continental plates move apart.
- Rocks fracture to form parallel faults.
- The rock between these faults collapses /subsides to form an elongated deep rift valley with steep sides.
- As the plates move apart, parts of the underlying mantle melts, forming magma. Magma rises through weak areas in the crust to the Earth's surface, to erupt as lava. The lava cools, solidifies and accumulates overtime to form volcanoes as successive eruptions occur.

Oceanic-Oceanic Convergence

- Two oceanic plates collide.
- The denser plate subducts beneath the **less dense** plate.
- This forms a deep elongated depression known as oceanic trench at the point of subduction in the subduction zone on the earth's surface.
- As the subducting plate sinks into the mantle, the high-pressure forces water out of its oceanic crust. Water lowers the melting point of the mantle in the overlying plate, causing it to melt, forming magma.
- Magma rises through weak areas in the crust to the Earth's surface and erupts as lava.
- Lava cools, solidifies and accumulates overtime to form chains of undersea volcanoes. Overtime, these volcanoes will rise above the ocean as volcanic islands or volcanic island arc.

Oceanic-Continental Convergence

- Oceanic plate collides with continental plate.
- The denser oceanic plate subducts beneath the continental plate.
- This forms a deep elongated depression known as oceanic trench at the point of subduction in the subduction zone on the earth's surface.
- As the subducting plate sinks into the mantle, the high-pressure forces water out of its oceanic crust. Water lowers the melting point of the mantle in the overlying plate, causing it to melt, forming magma.
- Magma rises through weak areas in the crust to the Earth's surface and erupts as lava.
- Lava cools, solidifies and accumulates overtime to form volcanoes on the continental plate.
- Enormous pressure at the plate boundary causes rocks on the continental plate to be uplifted and buckled to form fold mountains.

Continental-Continental Convergence

- Two continental plates collide
- Subduction does not take place because continental plates are buoyant and are of similar density.
- Enormous pressure causes the rocks to be uplifted and buckled to form fold mountains.
- Magma does not rise to the surface; hence no volcanoes are formed.