

Theory of plate tectonics | sample answer

Q. Using examples, explain the theory of plate tectonics.

The theory of plate tectonics states that the crust (lithosphere) is broken into 16 big slabs called plates. These plates are floating on magma and moving around as a result.

60 million years ago the last biggest movement happened in the plates. America separated from Europe. Fold mountains such as the Alps, the Himalayas and the Pyrenees come from this time.

The earth's core generates huge convection currents, the plates move because of this. The convection currents in the upper mantle drag the plates around.

If two plates collide (converge) they hit into one another, as a result some of the plate is destroyed and lost. This is called a destructive plate boundary.

An oceanic plate will sink under a continental plate when at destructive plate boundary, this is because the oceanic plate is more dense. eg Pacific plate and the the South American plate.

Because the oceanic plate sinks when it collides it slides down into the hot molten rock and is destroyed and recycled. This is called subduction.

This process can cause hot, melting rock to protrude through to the surface and cause a volcanic eruption, and also can cause the formation of volcanic mountains such as the Andes.

Neither plate will sink if 2 continental plates collide. The ground can do the opposite and be pushed upwards in a process called folding. The uplifted land can be called fold mountains and an example is the Himalayas.

Areas in which crust is created are called constructive plate boundaries. An example is a mid ocean ridge, deep under the ocean floor where land is created (Mid-Atlantic ridge has occurred due to the Eurasian and the North American plate are pulling apart.)

At the ocean ridges, two convection currents in the mantle flow away from each other. The crust floating on top as a result is split apart. This can create a rift valley.

At these spots the magma may also force its way up through the rift valley and flow out onto the sea bed to create new ocean floor. The name given to this is sea-floor spreading.

If the magma reaches the surface the lava will cool on the ocean surface and create large strings of undersea volcanic mountains, these mountains can be seen as a volcanic island if they are protruding to the surface.

Volcanos at constructive boundaries are weaker than those at destructive plate boundaries because there is less silica in the magma in constructive plate boundaries. This means gases can escape and it is very runny.

A rift valley can be formed when two plates pull apart and parallel faults occur in the crust. The land between these faults can sink creating a steep-side rift valley with a flat floor. Eg East african rift valley.