

Plate tectonics and the distribution of Earthquakes| sample answer

Q: 'Explain, with reference to examples that you have studied, how the theory of plate tectonics helps to explain the distribution of earthquakes around the world' (2012 Q1 B.)

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.

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.

Earthquake are vibrations in the earth's crust that occur when strain in the crust is suddenly released by displacement along a fault line.

The origin of the earthquake is call the focus, directly above the focus, on the surface is called the epicenter. Tremors disperse from the focus.

There are 3 types of plate boundaries and each is associated with earthquakes:

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.

When an oceanic plate subducts under a less dense continental plate. These zones create powerful earthquakes. (eg Asian Tsunami Quake 2004).

The subduction is a sudden burst and the focus can be up to 300km under the surface. They are usually 8 or 9 on the richter scale.

When **2 continental plates collide**, fold mountains are formed. (eg Himalaya Mountains)

The creations of fold mountains cause shallow quakes. The focus can be only 70km under the surface. Since they are shallow they can be very powerful eg the Sichuan Quake, China was 8 on the richter scale and only 19km below.

When **2 plates pass each other**, shallow quakes may occur (eg the boundary between the North American plate and the Pacific Plate.)

They can either slick smoothly past one another or lock against another, when this happens, pressure builds up for centuries and then in a jolt in releases. Causing huge damage because of the sudden movement.

The movement of plates and earthquakes can cause a tsunami if near an ocean. During the quake of Burren 2004, a devastating tsunami was an effect. The wave effected 11 countries in Southeast Asia, India and East Africa and cause more deaths and injuries than any other in history. The waves was 5 metres high, 320000 people were killed and 1.5m were made homeless.