

Key Vocabulary

Core:	centre of the Earth; the extremely hot inner core is solid and the outer core is molten
Crust:	outer layer of the Earth, which may be continental or oceanic, and consists of solid rock broken into tectonic plates
Mantle:	the layer of the Earth beneath the surface, which is semi-molten and very hot
Molten	melted
USA:	the third-largest country in the world by land area

Volcanoes and Earthquakes

Key Takeaways

- Hot lava and gas are erupted by volcanoes on land and in the sea. A volcanic eruption covers the ground or seabed in ash and lava. Most volcanic eruptions and earthquakes occur around the Pacific Ocean. This is called the Pacific Ring of Fire.
 - Pompeii, an ancient city in Italy, was buried by an eruption of the volcano Mount Vesuvius. Cotopaxi is a volcano in the Andes Mountains in Ecuador.
 - Earthquakes occur all the time, including in the UK. Cracks and movement of the ground and lots of damage are caused by earthquakes. Lots of earthquakes occur in the **USA** along the coast of California when the San Andreas Fault moves.
 - When tectonic plates move against each other, heat is generated – see the images to the right. This can heat and mobilise material in the Earth. Along with other **molten** material at depth, this can move upwards and come out through cracks in the Earth's surface as lava. The volcanic eruptions can be fairly gentle, with lava running downhill and over the surface; can throw much volcanic ash into the air; or can be explosive. In very explosive eruptions, great boulders of rock can be thrown high into the sky.
 - Volcanic eruptions under the sea, such as along the Mid-Atlantic Ridge, mean that the eastern and western sides of the Atlantic are moving apart along this ridge (at about 2.5 centimetres a year) and lava comes up and fills the gap.
 - Converging plates (plates moving towards each other) are associated with mountain building and / or volcanoes, such as the Himalayas (where India meets Asia), the Andes (where there are active volcanoes, such as Cotopaxi) and the Ring of Fire. Subduction is when one plate is forced underneath another where they meet. At depth, the rocks in the sunken plate melt and lava is forced up through fractures, to erupt as volcanoes.
 - An example of diverging plates is the Mid-Atlantic Ridge, where the Eurasian plate and the North American plate are moving apart, at about 2.5 centimetres a year. Magma from the Earth's **mantle** rises to create new **crust** in the gap. Iceland sits on this ridge and is very actively volcanic.
 - The San Andreas Fault in San Francisco, USA, is an example of plates sliding past each other. Tension increases along faults in the Earth's crust as the plates grind together, which sudden movement – an earthquake – relieves.
- The Ring of Fire has all three types of plate boundary. It is the world's most active earthquake and volcanic zone.

Questions

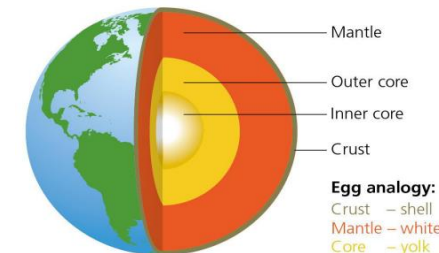
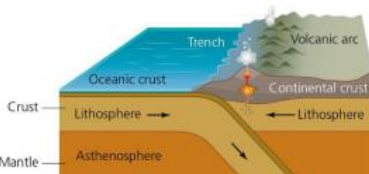
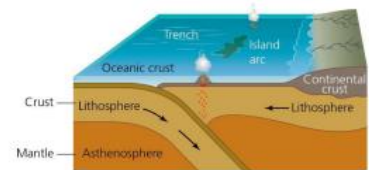
- What is happening when the Earth shakes?
- What is happening when the Earth rattles and rolls?
- Does the Earth shake, rattle, and roll all over?
- How and why do people live where the Earth shakes, rattles, and rolls?
- How disastrous have recent earthquakes/volcanoes been?

These diagrams show convergent boundaries:

a) When *ocean plates* move towards each other (converge), an arc of islands with volcanoes is formed. The Philippines, Java and Sumatra are examples, but there are lots of others around the Pacific Ocean.

b) When an *ocean* and a *land (continental)* plate move towards each other, mountains with volcanoes are formed. The Andes in South America are an example.

c) When *two land (continental)* plates move towards each other, mountains are formed. The Himalayan Mountains are an example.



This diagram at the bottom shows *divergent plate boundaries* – where new crust is generated as the plates pull away from each other. Convergent boundaries are where crust is destroyed as one plate dives under another, and transform boundaries are where crust is neither produced nor destroyed as the plates slide horizontally past each other.

