| Year 8 Earthquakes |

Plate Boundaries

The Earth's Crust is broken into different tectonic plates which sit on the Earth's mantle. Tectonic plates move in different directions because of convection currents, and meet at plate boundaries.

Constructive	The tectonic plates move apart.
Destructive	The plates collide causing the oceanic plate to subduct under the continental plate.
Conservative	The plates slide past each other in opposite directions, or in the same direction but at different speed
Collision	Two continental plates collide, neither can sink and so the land buckles upwards to form fold mountains.
Convection Currents	Heat from the core makes magma in the mantle rise towards the crust. As the hot current nears the crust, it begins to cool and sink back towards the core. As the magma sinks, it drags the plates across the surface of the Earth.
Plate Boundary	The point at which two or more plates meet.
Subduction Zone	A collision between two of Earth's tectonic plates, where one plate is forced into the mantle underneath the other plate.

Earthquakes

Earthquake	A sudden shaking of the ground, caused by movement in the Earth's crust.
Seismic Waves	An elastic wave in the earth produced by an earthquake.
Focus	The location where the earthquake begins.
Epicentre	The point on the Earth's surface located directly above the focus of the earthquake.
Prediction	Using seismometers to monitor earth tremors. Experts know where earthquakes are likely to happen. However, it is very difficult to predict when they will happen.
Preparation	Hospitals, emergency services and residents practise for an earthquake. They have drills in all public buildings so that people know what to do. This helps to reduce the impact and increases their chance of survival.
Protection	Protection involves constructing buildings so that they are safe to live in and will not collapse. E.g. rubber foundations and steel frames
Social Impacts	Anything that affects people and families
Economic impacts	Anything to do with money or which affects the ability of people or country to make money
Environmental Impacts	Anything which affects animals, plants of ecosystems in the area.
Seismometer	A machine which detects and records vibrations in the Earth's crust
Richter Scale	Quantitative measure of an earthquake's magnitude(size). Each point of the scale, is 10x greater than the one previous.
Mercalli Scale	Based on observable data of earthquake damage which can be subjective.

Case Studies

Haiti (LIC), 2010

Impacts:
7.0 Magnitude quake struck near Port au Prince.
3,500,000 people were affected by the quake.
220,000 people estimated to have died..
300,000+ people were injured.
Over 188,383 houses were badly damaged and 105,000 were destroyed. 1.5m people became homeless.
4,000 schools were damaged or destroyed.
Short Term Responses:USA sent rescue teams and 10,000 troops.
Bottled water and purification tablets provided.
Aid was slow to arrive due to damaged port.
£20 million donated by the UK.
Long Term Responses: Improved water supply of 340,000 people
Tools and seeds given to help 23,000 people in farming
Improved shelter for 34,000 people
Cholera treatment facilities set up.

New Zealand (HIC), 2011

Impacts:
6.3 Magnitude quake struck 10km west of Christchurch.
185 people were killed.
3129 people were injured
6800 people received minor injuries
100,000 properties were damaged, and the earthquake demolished 10,000
$28 billion of damage caused
Liquefaction destroyed many roads and buildings.
Short Term Responses: £5-6 million of international aid was provided
Red Cross and other charities supplied aid workers.
Rescues crews from all over the world including UK, USA, Taiwan and Australia.
Long Term Responses: Construction of 10,000 affordable homes. NGOs provided support including Save The Children.
Canterbury Earthquake Recovery Authority was created to organise rebuilding the region. It had authority to change planning laws and regulations.

| Year 8 Volcanoes |

Volcanic Eruption Keywords

Magma	Molten rock from the mantle before it reaches the Earth's surface
Lava	Once magma reaches the surface of the Earth it os called lava.
Crater	A bowl-shaped basin on the top of the volcano
Ash	Very small solid particles ejected from a volcano during an eruption
Pyroclastic Flow	A mass of hot ash, gases and lava fragments which is ejected from a volcano at great speeds.
Lahar	A mudflow composed of debris and water.
Volcanic Bombs	A large mass of molten rocks ejected by the volcano during an eruption.
Active	Volcanoes which erupt frequently.
Dormant	Volcanoes which have not erupted recently but may still erupt.
Extinct	A volcano which is unlikely to ever erupt again.

Predicting and Monitoring

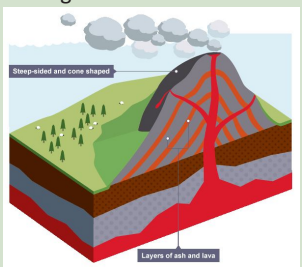
Volcanic eruptions are unpredictable. However, scientists can monitor volcanoes to estimate when they are likely to erupt.

Seismometers	Used to measure earthquakes occurring near the volcano.
Tiltmeters	These devices monitor any changes in landscape. Volcanoes tend to swell when they are close to erupting.
Monitoring gases	Often there is an increased release of sulphur dioxide near an eruption.
Measuring Temperature	Volcanoes become hotter when magma starts to rise through the vents.
History	Scientists can identify patterns of activity by looking at the history of a volcanoes eruptions.

Structure of Volcanoes

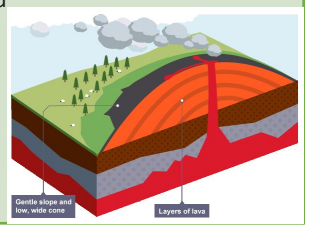
Composite Volcano

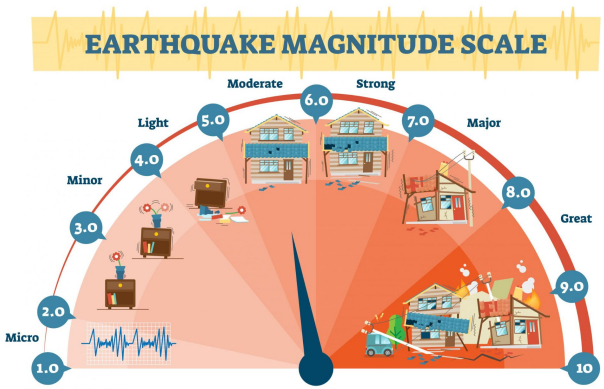
Composite volcanoes are found on **destructive plate margins**, where the oceanic crust sinks beneath the continental crust.
Composite volcanoes have the following characteristics:
Acidic lava, which is very viscous (sticky).
Steep sides as the lava doesn't flow very far before it solidifies.
Alternate layers of ash and lava.
Violent eruptions.
Longer periods between eruptions.



Shield Volcano

Shield volcanoes are found on **constructive plate margins**, where two plates move away from one another. Shield volcanoes have the following characteristics:
Basic lava, which is non-acidic and very runny.
Gentle sides as the lava flows for long distances before it solidifies.
No layers, as the volcano just consists of lava.
Less violent eruptions shorter periods between eruptions.





Case Studies

Montserrat (LIC), 1995-97

Impacts:
Volcano Explosivity Index = 3
19 people killed. 11,000 people evacuated to the north of the island.
Lahars destroyed large areas of farmland and 150 homes. The capital city, Plymouth was covered in 5mm layers of ash and mud. The only hospital, airport and many roads were also destroyed.
Unemployment rose due to collapse of tourist industry.
Short Term Responses:
Large scale evacuation by the British Navy.
Abandonment of the capital city, Plymouth
£50 million redevelopment money donated by the UK government
Long Term Responses: An exclusion zone was set up. A volcanic observatory was built to monitor the volcano. New roads, hospital and airports were built. Growth in adventure tourism seeing 5000 each year.

Eyjafjallajokul (HIC), 2010

Impacts:
Volcano Explosivity Index = 4
Day turned to night, with ash blocking out the sun.
Homes and roads were damaged. Crops damaged.
Ash cloud brought European airspace to a standstill costing airlines £130 million per day.
Imports and exports impacted across Europe, including food and raw materials. 100 cubic meters of lava and 1000 million c/m of tephra erupted.Glacier melted causing 200-3000 metres cubed per second of flooding. Fluoride contaminated water supplies. Volcano released 30,000 tonnes of CO_2 into the air each day.
Kenya lost £2.7 million in exports
Short Term Responses: European Red Cross mobilised volunteers to help people affected. It provided food for the farming population, as well as counselling and psychological support.
700 people were evacuated from the disaster zone. **Long Term Responses:**
The eruption lead to increased awareness of the impact of volcanic ash on air traffic.