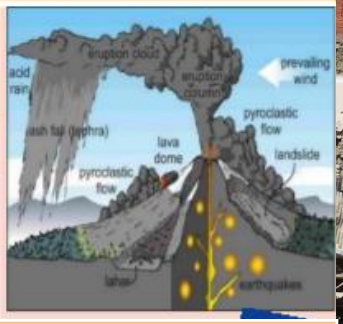
The structure of the Earth

The Crust	Varies in thickness (5-70 km). Made up of giant slabs of rock called tectonic plates. Can be oceanic or continental.
The Mantle	Widest layer (2900km thick). The heat and pressure means the rock is in a liquid state **(magma)** that is in a state of convection.
The Inner and outer Core	Hottest section (5000 degrees +). Mostly made of iron and nickel and is 4x denser than the crust. Inner section is solid whereas outer layer is liquid.

Volcanic Hazards

Ash cloud	Small pieces of pulverised rock and glass which are thrown into the atmosphere.
Gas	Sulphur dioxide, water vapour and carbon dioxide come out of the volcano.
Lahar	A volcanic mudflow which usually runs down a valley side on the volcano.
Pyroclastic flow	A fast moving cloud of super-heated gas and ash (up to 1000°C). They travel at up to 450mph down the side of the volcano
Volcanic bomb	A thick (viscous) lava fragment that is ejected from the volcano.



Convection Currents

The crust is divided into tectonic plates which are moving due to convection currents in the mantle.

1. Radioactive decay of some of the elements in the core and mantle generate a lot of heat.
2. When lower parts of the mantle molten rock (Magma) heat up they become **less dense** and **slowly rise**.
3. As they move towards the top they cool down, become **more dense** and **slowly sink**.
4. These **circular movements** of semi-molten rock are **convection currents**
5. Convection currents create **drag** on the base of the tectonic plates and this causes them to move.

Types of Plate Margins

Destructive Plate Margin

When the denser plate subducts beneath the other, friction causes it to **melt and become molten magma**. The magma forces its way up to the surface to form a volcano. This margin is also responsible for **devastating earthquakes**.

Constructive Plate Margin

Here two plates are **moving apart** causing new magma to reach the surface through the gap. Volcanoes formed along this crack cause a submarine mountain range such as those in the **Mid Atlantic Ridge**.

Conservative Plate Margin

A conservative plate boundary occurs where plates **slide past each other** in opposite directions, or in the same direction but at different speeds. This is responsible for earthquakes such as the ones happening along the San Andreas Fault, USA.

LIC case study Nepal 25th April 2015
Magnitude: 7.9 on the Richter scale

Causes
Indian and Eurasian plate colllided. Focus 15km deep; Epicentre 50 miles NW of Kathmandu.

Effects
9000 dead, 20,000 injured, 8,000,000 affected. Buildings and infrastructure destroyed; Communities cut off by landslides and avalanches; Flooding as landslides block rivers; Power, sanitation and communications cut; US$5 billion of damage.

Responses
Overseas aid (NGO's) plus helicopters for search, rescue and remote drops of supplies.
300,000 people left Kathmandu for shelter from family and friends.
Indian border blockade - fuel, medicine and construction material shortages.
Roads repaired, Floods drained, landslides cleared

Unit 1a

AQA

The Challenges of Natural Hazards

What is a Natural Hazard

A natural hazard is a natural process which could cause death, injury or disruption to humans, property and possessions.

Geological Hazard	Meteorological Hazard
These are hazards caused by land and tectonic processes.	These are hazards caused by weather and climate.

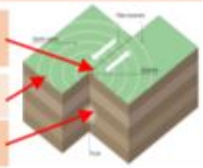
Causes of Earthquakes

Earthquakes are caused when two plates become **locked** causing **friction** to build up. From this **stress**, the **pressure** will eventually be released, triggering the plates to move into a new position. This movement causes energy in the form of **seismic waves**, to travel from the **focus** towards the **epicentre**. As a result, the crust vibrates triggering an earthquake.

The point directly above the focus, where the seismic waves reach first, is called the EPICENTRE.

SEISMIC WAVES (energy waves) travel out from the focus.

The point at which pressure is released is called the FOCUS.



Earthquake Management

PREDICTING

Methods include:
- Satellite surveying (tracks changes in the earth's surface)
- Laser reflector (surveys movement across fault lines)
- Radon gas sensor (radon gas is released when plates move so this finds that)
- Seismometer measures vibrations or shaking in the crust.
- Water table level (water levels fluctuate before an earthquake).
- Scientists also use seismic records to predict when the next event will occur.

PROTECTION

You can't stop earthquakes, so earthquake-prone regions follow these three methods to reduce potential damage:
- Building earthquake-resistant buildings
- Raising public awareness through education
- Improving earthquake prediction

NEE case study Chile 27th February 2010 (03:35am)
Magnitude: 8.8 on the Richter scale

Causes
Destructive plate boundary. The Nazca plate was subducted (pushed under) the South American Plate.
Epicentre: 70 miles away from the city of Concepcion
Focus: 22 miles (35 km) deep

Effects
500 killed, 20,000 injured, 800,000 affected; 220,000 homes, 4500 schools, 53 ports, 56 hospitals destroyed; Main port and airport badly damaged; power, water and communications cut; US$30 billion damage.
Secondary effects, Tsunami devastated coastal towns; 1500km of roads damaged and communities cut off; Area around Santiago chemical plant evacuated due to a fire.

Responses
Temporary repairs to route 5 allowed aid into affected areas.
Power and water restored to 90% of homes within 10 days.
A national appeal raised money for 30,000 emergency shelters.
One month later a housing reconstruction plan was launched.
Not much foreign aid was needed due to Chile's strong economy.