Natural Processes 🡪Natural Events 🡪Extreme 🡪Affecting cultural Environment

Definition – Extreme natural events which you put peoples actions, property or resources at risk

Extreme natural events are only natural hazards if they threaten peoples activities (cultural process), or property (cultural resources)

Impacts

What kind of impacts do these events have? Think about short term and long term, primary and secondary, economic, social, cultural, etc.

Earths internal structures

Planet Earth contains 3 compositional layers

1. Core Spherical, dense, metallic iron

-Inner core

-Outer core

2. Mantle- thick shell of dense rocky matter

3. Crust- Thinnest layer, rocky matter

Continental – Average thickness (45 km)

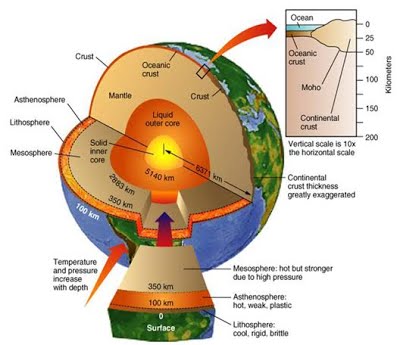
Oceanic- Average thickness (8 km)

Processes

Continental crust is thick but not dense

Oceanic crust is thin but dense

Diagram of Earths inner layers



Continental Drift theorised by Alfred Wegener in 1912

The theory was developed out of these ideas=

During the 1950s the following scientific developments reinforced Wegener’s Theory of Plate Tectonics

Youth of the ocean floor

Reversal of Earth’s magnetic field

Sea floor spreading

Documentation of earthquake and volcanoes activity

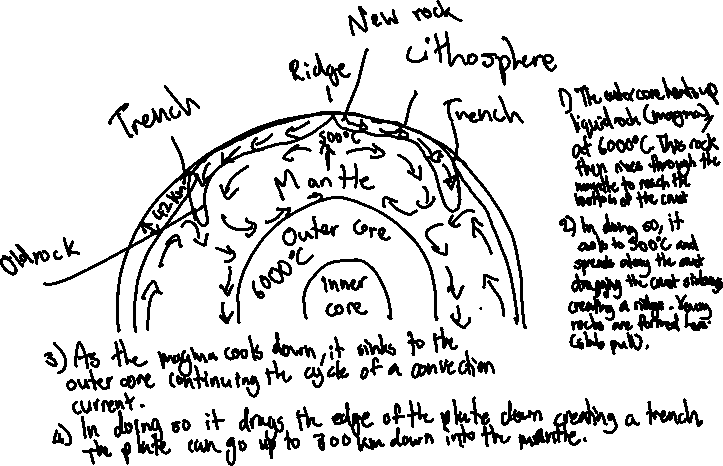
The Earths crust is made up of a number of Tectonic Plates. These plates move over the surface of the globe. The edges of plates are called plate margins.

Tectonic Plates- Massive, irregularly shaped slabs of rock.

Molten rock beneath the surface is called magma.

At particular places called “hot spots”, magma rises to the surface in a series of convection currents. When the currents reach just below the crust they can rise no more. Instead the hot currents spread out and carry the crust in a series of plates across the globe.

Convection currents- Movement of particles within liquid or gas.



Constructive Plate Margin

When two plates move away from each other

Crust is being formed

As the convection currents spread out they pull the crust apart. At this point a crack in the crust is formed, called a rift valley.

Rift valley- A linear trough formed by convection currents forcing the crust to be pulled apart.

Molten Magma reaches the surface through this crack, producing volcanoes on the surface of the Earth and ocean ridges under the ocean.

Volcano- An opening in the crust of the earth from which molten lava, volcanic gases and pyroclastic material are ejected.

Ocean Ridge- A linear elevation of the ocean floor where magma arrives at the crust and adds to the oceanic crust.

Destructive Plate Margin

Where two plates collide with each other

Crust is being destroyed

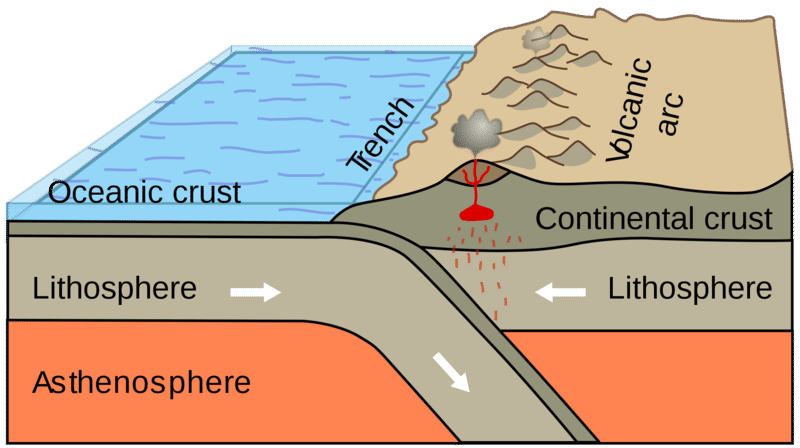
Oceanic – Continental Convergence

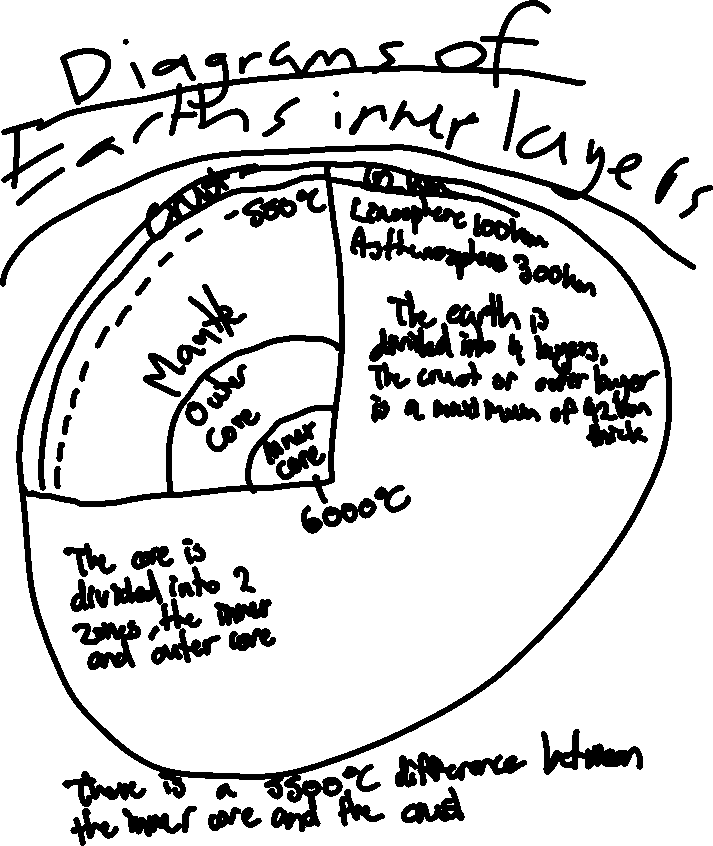
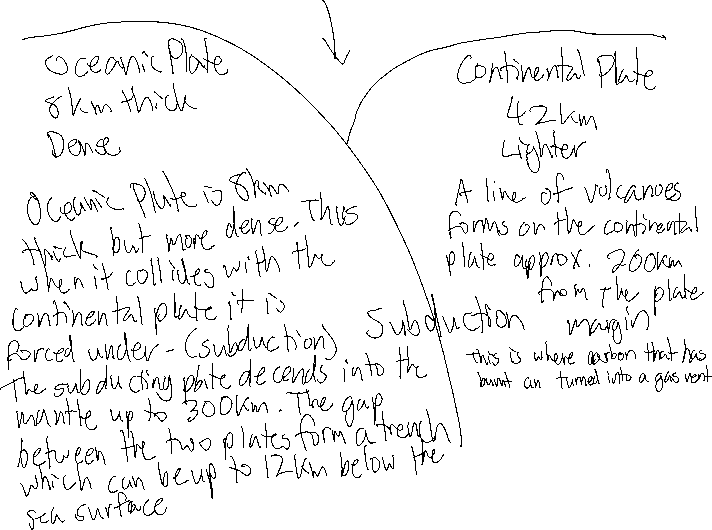
Oceanic crust subducts continental crust- Oceanic crust subducts because it is more dense

As oceanic crust sinks it is broken off and destroyed due to the heat and pressure

Trenches form at subduction zone beneath the ocean

Rising magma penetrates continental crust to form volcanoes- Source of magma- Partial melting of oceanic slab or the overlying continental lithosphere or both?





Forces beneath the Crust

Convection currents also move the crust towards other plates. On of the plates will be forced down the other at the subduction zone. The rocks left on the other plate are crumpled into fold mountains. The crust that is dragged beneath the surface is destroyed – hence the name “destructive plate margins.”

Oceanic Convergence- One oceanic plate is subducted beneath the other. Trenches formed at the subduction zone. Formation of volcanoes- Island arcs

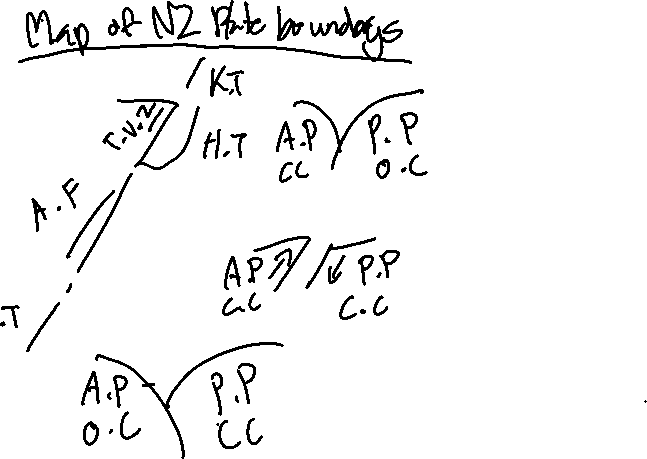
Continental Convergence- No subduction because both plates are heavy. Crust buckles and is pushed upwards or sideways. Fold mountains are formed.

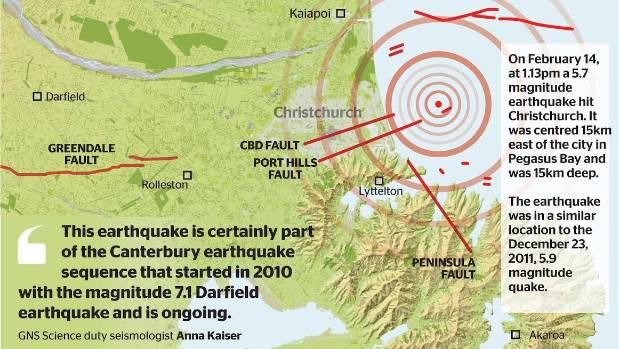
Conservative Plate margins- Sometimes plates pass alongside each other neither colliding nor pulling apart.These plate margins are known as conservative plate margins, since crustal material is neither being created nor lost. However the crust may still crack and faults will still be created.

New Zealand

North Island- Pacific Plate (oceanic crust) is subducting Australian Plate (continental crust). Formation of volcanoes (Taupo Volcano zone). Formation of trenches (Hikurangi Trench, Kermadec Trench)

South Island- Pacific Plate (oceanic crust) is colliding with Australian plate (continental crust). Australian Plate is sliding (north) past Pacific plate. Australian plate is subducting Pacific Plate.





Christchurch has 4 major faultlines running under and around the city. The faultlines run off the main alpine fault. These faults have ruptured since 2010. These quakes have been at different depth and magnitudes. The worst being on Feb 22nd at 12:51pm of 6.3 magnitude and 5km depth.

