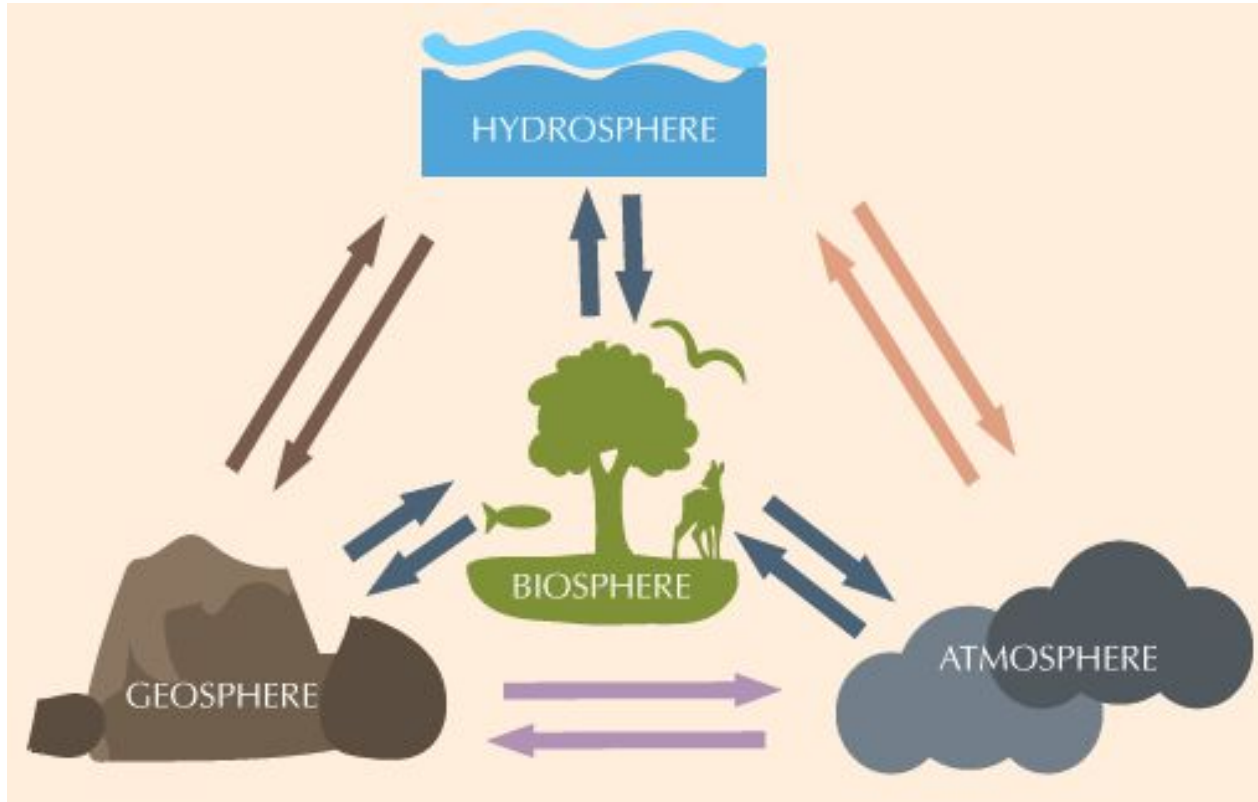


Q2 Review

Ms. Larsh

**Model evidence of
Earth's interior to
describe the cycling of
matter by thermal
convection**

Earth's Systems are Interconnected



Recycled Materials

- Water
- Oxygen
- Carbon Dioxide
- Nitrogen
- Carbon
- Earth's Crust

What is Thermal Convection?

Convection, process by which **heat** is transferred by the movement of a heated fluid such as air, water, or magma

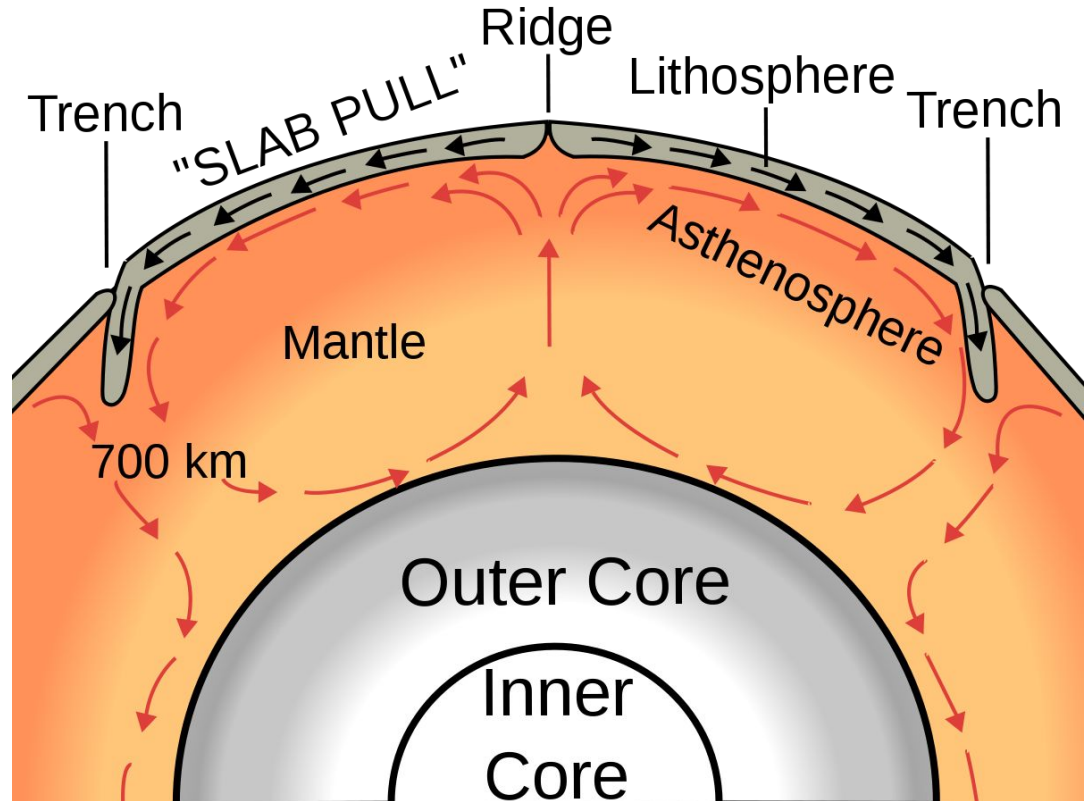
Convection Current, a current in a fluid that results from convection

Geothermal energy, or the heat generated by the **radioactive decay** of elements deep in the interior of the Earth heats up magma, creating convection currents that drive plate tectonics

Harry Hess & the Theory of Seafloor Spreading

Lithosphere - *Earth's Crust and upper part of the Mantle*

Asthenosphere - *Upper layer of Earth's Mantle just below the Lithosphere*



Describe Seafloor Spreading

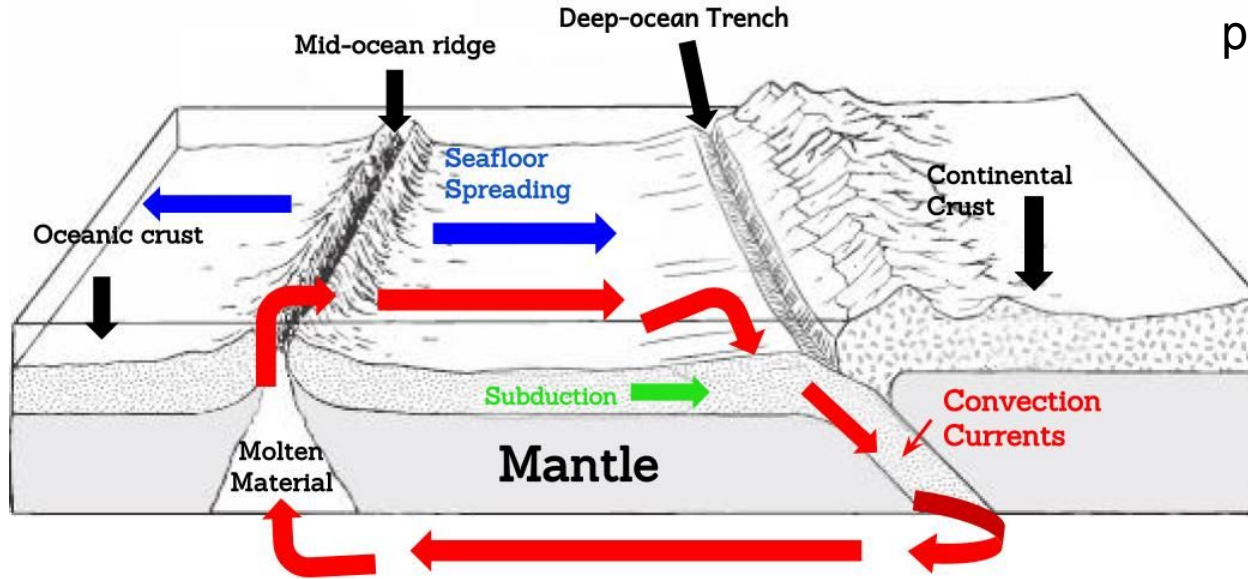
Seafloor spreading is a process that occurs at **mid-ocean ridges**, where new oceanic crust is formed at a **divergent boundary** through volcanic activity

At a **convergent boundary**, the oceanic plate **subducts** beneath the other plate resulting in a **deep sea trench**

The seafloor continuously “recycles” back into the mantle at these locations.

Thus, the oldest seafloor is only around 200 million years old.

Seafloor Spreading Model



Remember, **Convection Currents** drive every major process on Earth

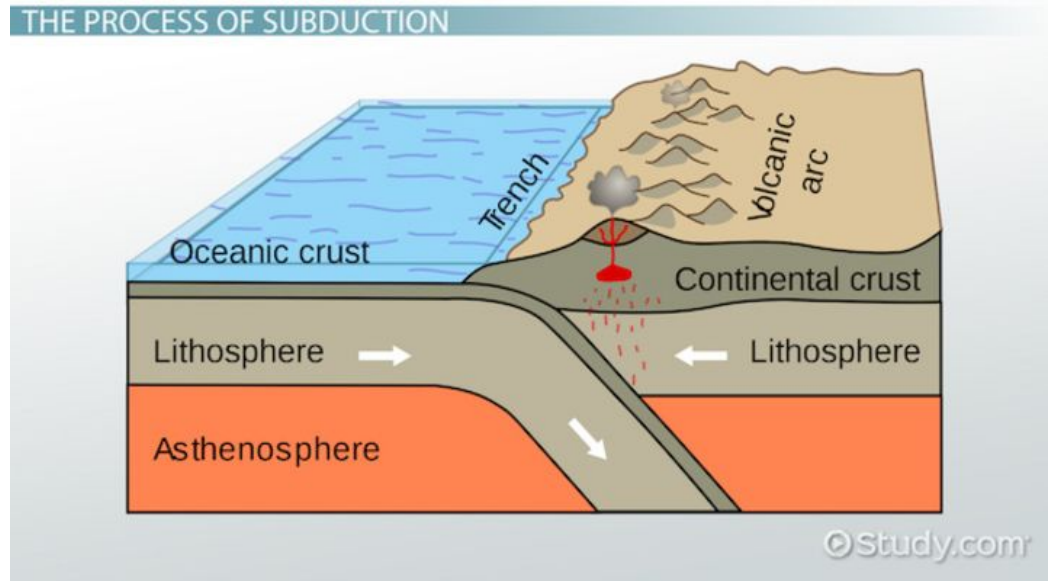
Seafloor spreading & plate tectonics are powered by convection currents produced by **geothermal energy**

Subduction & Volcanic Activity

Large amounts of **water** enter the mantle at **subduction sites**

The **boiling point** of magma is **lowered** and more magma is able to **rise** upward

The magma escapes through Earth's crust causing **volcanic activity**



Alfred Wegener & the Theory of Continental Drift

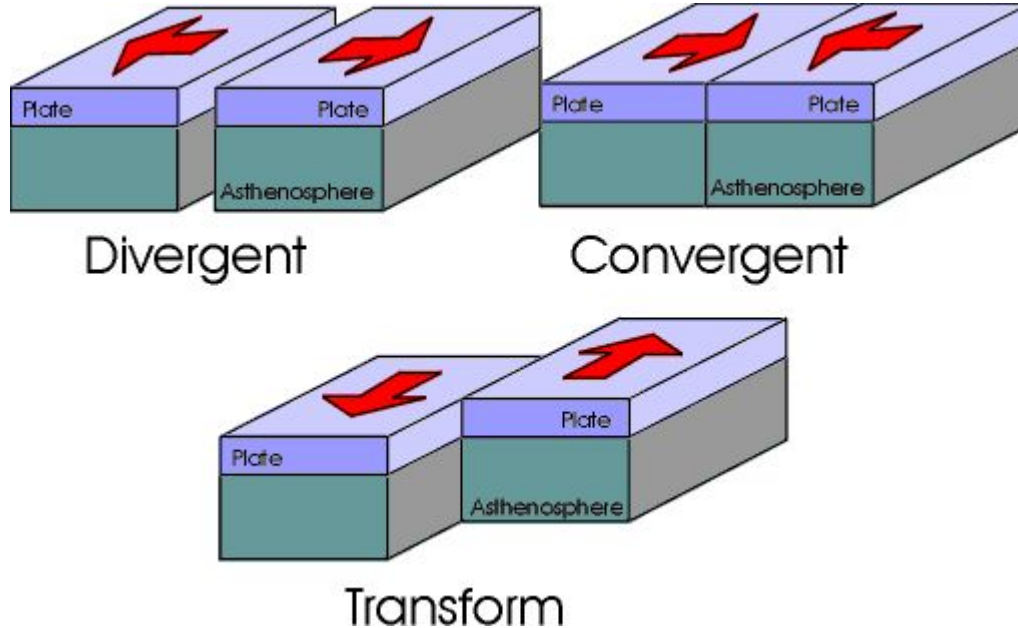
Continental drift was a theory that explained how **continents** shift position on Earth's surface

He proposed that at one point, all of the continents were a single land mass, which he called **Pangea**

- Fossils on different continents match up
- Mountain Ranges match up
- Coastlines seemed to fit like puzzle pieces
- Glacial scarring and deposits
- Some fossils could never have survived on the continents they were found on in their current location

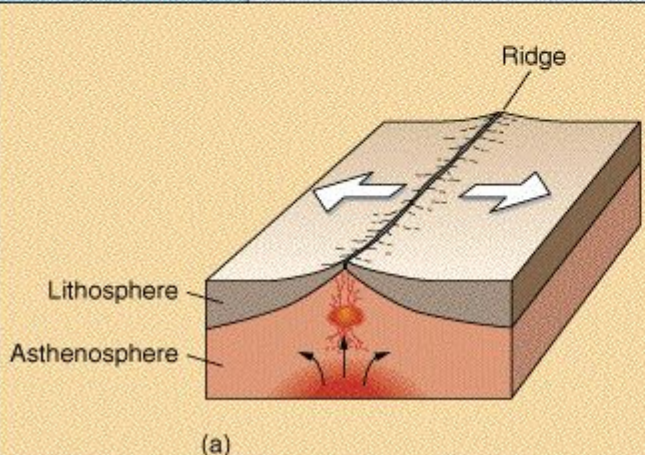


3 Types of Plate Boundaries

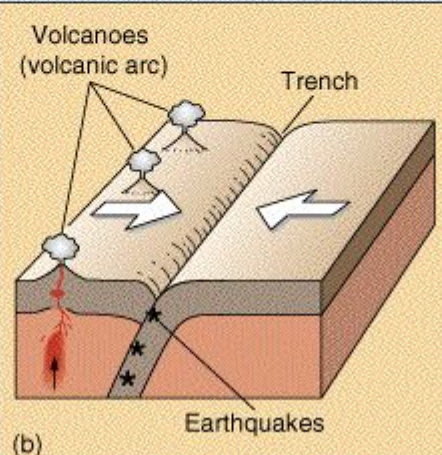


Oceanic Plates

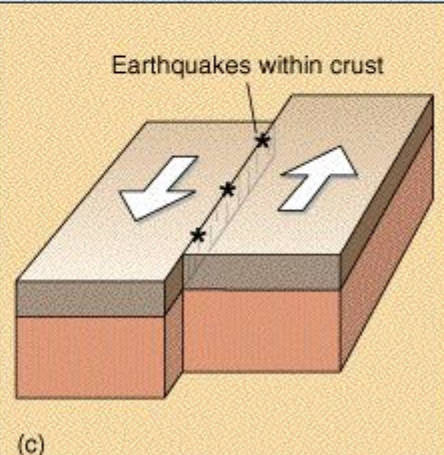
Type of Margin	Divergent	Convergent	Transform
Motion	Spreading	Subduction	Lateral sliding
Effect	Constructive (oceanic lithosphere created)	Destructive (oceanic lithosphere destroyed)	Conservative (lithosphere neither created or destroyed)
Topography	Ridge/Rift	Trench	No major effect
Volcanic activity?	Yes	Yes	No



(a)



(b)

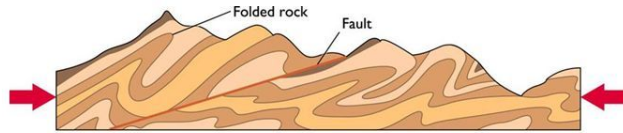


(c)

Continental Convergent Boundary

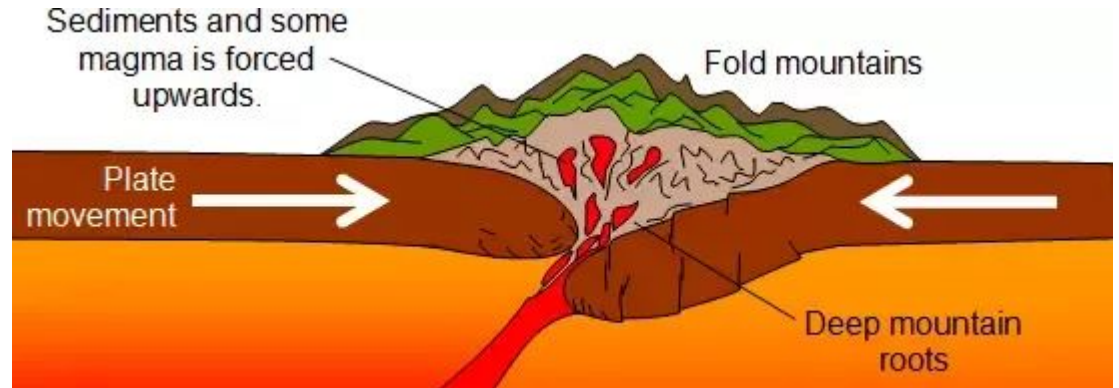
- **Folded Mountains** occur when 2 continental plates collide

Ex: The Himalayas

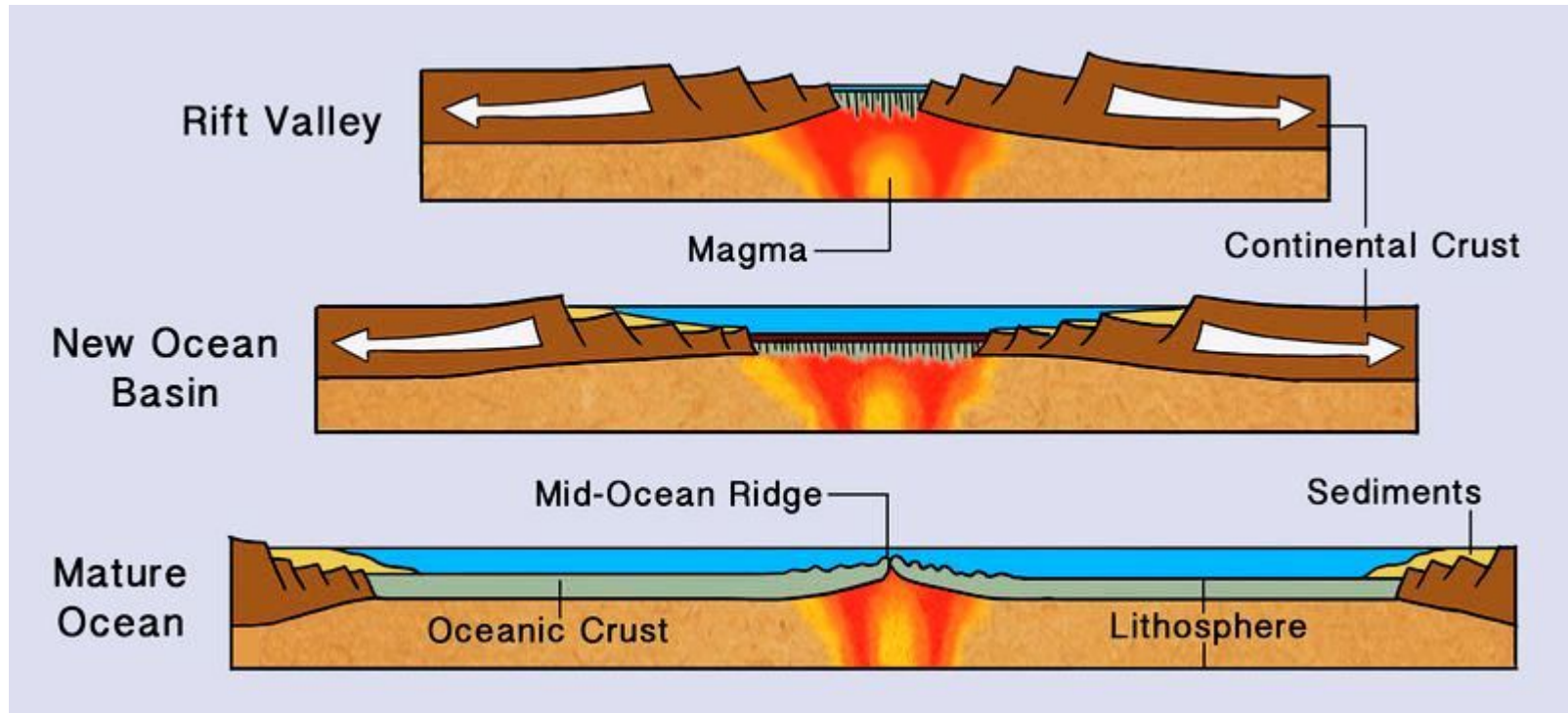


(b) SEDIMENTARY ROCKS SQUEEZED BY COMPRESSION

http://tasaclicks.com/illustrations/Convergent_Boundary.jpg



Continental Divergent Boundary



Great Rift Valley, Africa



The Himalayas, Asia

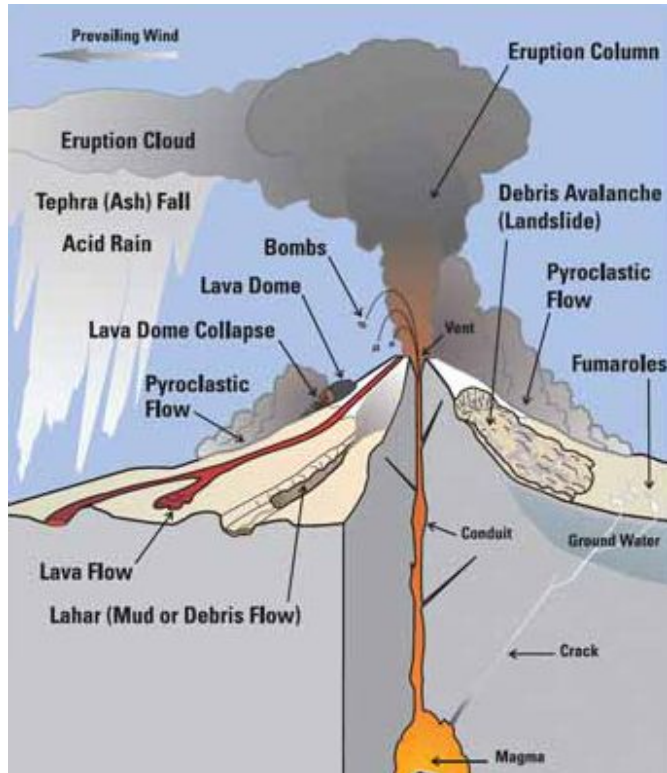


What are some Natural Disasters that occur along Plate Boundaries?

- Volcanic Eruptions
- Earthquakes
- Tsunamis resulting from Earthquakes

**Model evidence of
changes in Earth's
magnetic field through
seafloor spreading &
volcanic events
throughout geologic time**

Volcanism



Volcanic Eruptions & the Rock Record

The **ash** from volcanic eruptions often changes the **composition of rock** layers

Geologists can identify times of volcanic eruptions through the noticeable **bands of sediment** that are different in color.

Igneous rock, or rock layers formed from **magma**, are often noticeable as intrusions and crosscuts where magma interacted with other, older rock layers



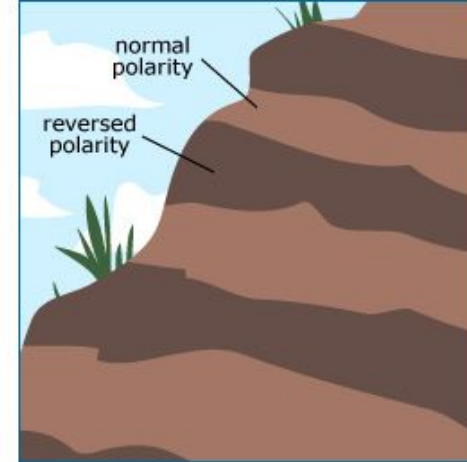
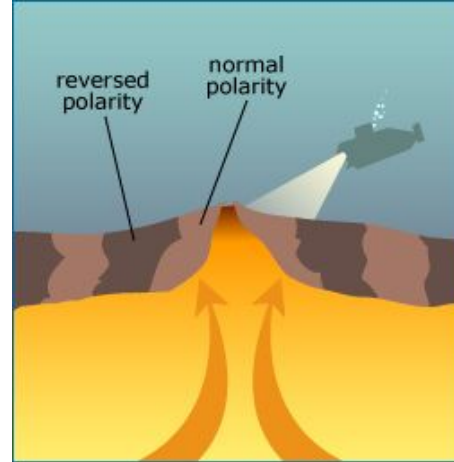
Volcanic Activity & Earth's Magnetic Field

Magma interacts with Earth's **magnetic field** and retains the **polarity** at the time it solidifies

This banded pattern is studied across the ocean floor and supports the **Theory of Seafloor Spreading**

The magnetic field flip flops in a symmetrical pattern across the seafloor

As well as on land where layers of sediment build around active volcanoes



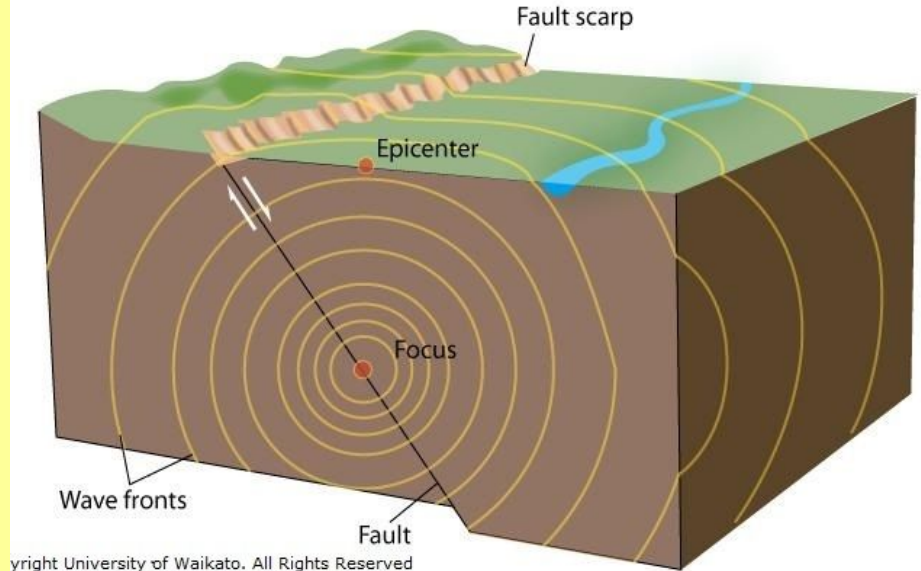
**Model evidence of
Earth's interior
composition through the
use of seismographic
data**

Earthquakes

- An **earthquake** is a shaking of the Earth's crust caused by a release of energy.
- A **fault** is a break in the lithosphere along which movement has occurred.
- The **focus** of an earthquake is the point at which movement first occurs.
- The **epicenter** of an earthquake is the point on the surface of the Earth directly above the focus.

[Earthquake animation](#)

Seismic Waves Radiate from the Focus of an Earthquake



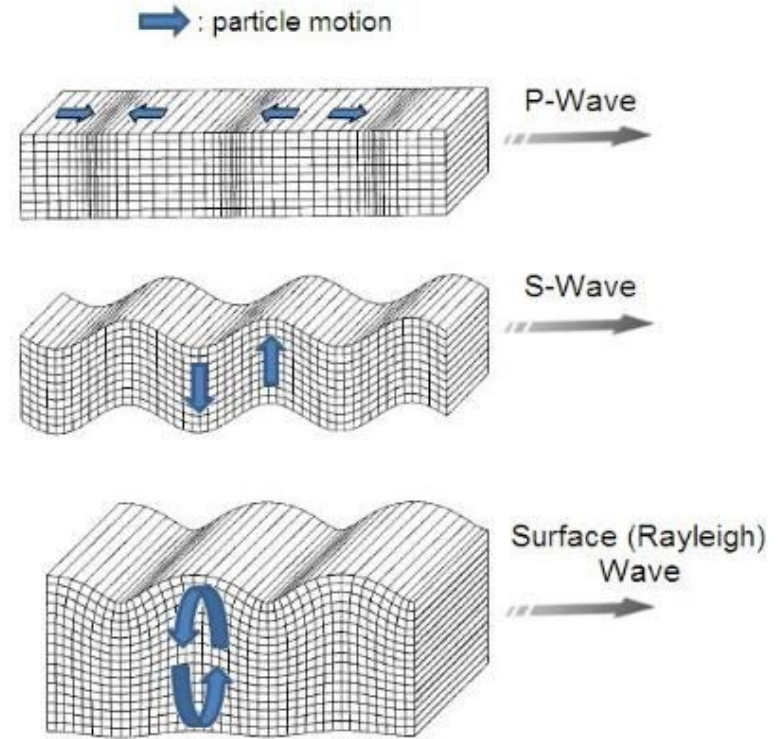
Seismic Waves

P-waves travel the **fastest** and move **side to side** in the direction that the wave is traveling

S-waves are **slower** and move **up and down** and cannot move through liquid

***S-waves** led seismologists to conclude that the Earth's has an **outer liquid core**

Surface waves are the most **destructive**



Secondary Waves & the Discovery of Earth's Liquid Outer Core

***S-waves** led seismologists to conclude that the Earth's has an **outer liquid core**

