**Continental Drift** – 1st proposed by Alfred Wegener in 1915

* Supercontinent Pangaea started to break up about 220 million years ago.
* “pan” means all; “gaea” means earth

**Earth Composition –** Inner Core, Outer Core, Mantle, Crust

* the “**Lithosphere**” contains the earth’s crust and the uppermost part of the upper mantle.
* “**Asthenosphere**” - *A partly MOLTEN layer of the upper mantle*

There are 7 major plates and 5 minor plates – 12 plates total.

The plates move approximately 1 inch per year ~ 2cm

* plates move due magma convection currents in the Asthenosphere (upper mantle)

**HOT SPOT** - is a geological area where molten rock rises to Earth’s surface! ex. Hawaii Islands

**3 Types of plate Boundaries**

1. **Diverging Plates**
2. In Ocean - “Spreading Centers” – Mid-Atlantic Ridge
3. On Land – “Rift Valleys” are areas of the Earth’s surface where splits apart
4. **Converging Plates (3 types)**
5. **Oceanic - Continental Plate Convergence**

Oceanic plate is denser and dives under the continental plates

- causes volcanic belts and earthquakes

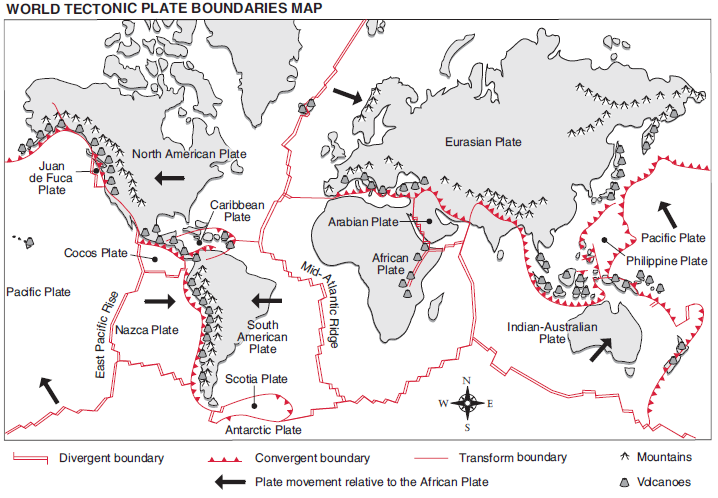
1. **Oceanic - Oceanic Plate Convergence…**

The denser plate subducts under the other, a deep ocean trench is formed, and the subducting plate sinks deep into the mantle

- causes volcanic island arc ( ie. Japan islands and Aleutian island in Alaska) and earthquakes

1. **Continental - Continental Plate Convergence…**

When continental plates collide, subduction DOES NOT occur because the plates are the same density. - forming great Mountain ranges ( ie. The Himalayas)

1. **Transform Plates** – is when a plates slide past each – no volcano or mountains form, earthquakes

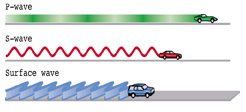
**Earthquakes - ~**95% of all earthquakes occur along plate boundaries

80% of the world’s earthquakes occur in a ring that borders the pacific ocean - Ring of Fire

An Earthquake starts at a location inside the Earth called a “**focus**” (foci)

The “**epicentre**” is the point on the **EARTH’s SURFACE** directly above the focus.

**SEISMIC WAVES -** are the vibrations (waves) of energy released by a quake!

**Primary-wave**:

- Fastest

*-*Side to side motion

*(These make the sound that we hear)*

**Secondary-wav**e:

-S for “secondary”

-Up/down motion

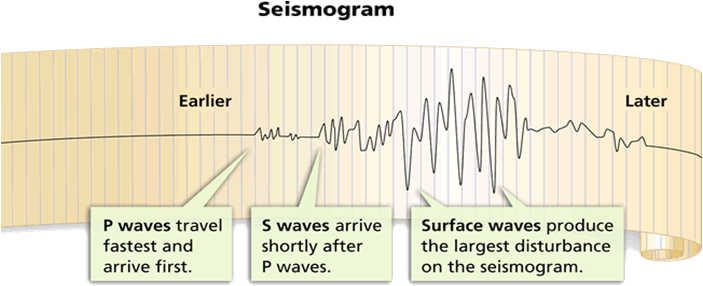
**Surface waves**:

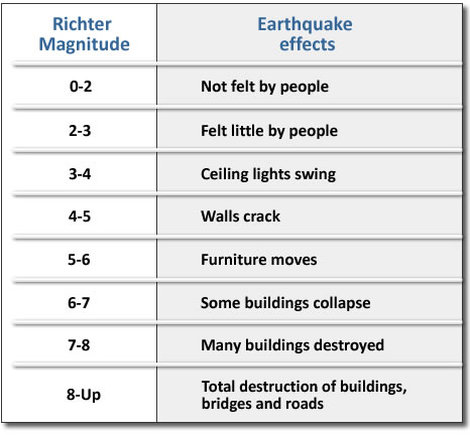
-Slowest

-Travel only on ground (or water) surface

-Damaging to structures

-Circle Motion

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The **Richter's magnitude scale** is for measuring the strength

("**size") of earthquakes**

**Volcanoes**

1. **Composite Volcano – Mt. St. Helens (cone-shaped)**

* Found along plate boundaries, usually by subduction zones
* Layers of ash and thick lava form a tall cone.
* As magma reaches the surface, it cools, hardens, and traps gases below.
* Pressure builds; eventually, there is an eruption.

2) **Shield Volcano** (Hawaii Island,Yellowstone, **largest type**)

- these are not found at plate boundaries but instead form over hot spots.

- Thin magma/lava flows out from a hot spot and forms a low, wide cone.

3) **Rift eruptions** - occur at rifts and ridges (diverging plate, cracks in lithosphere)

- fountains of lava, Not very destructive or violent