Layers of the Earth

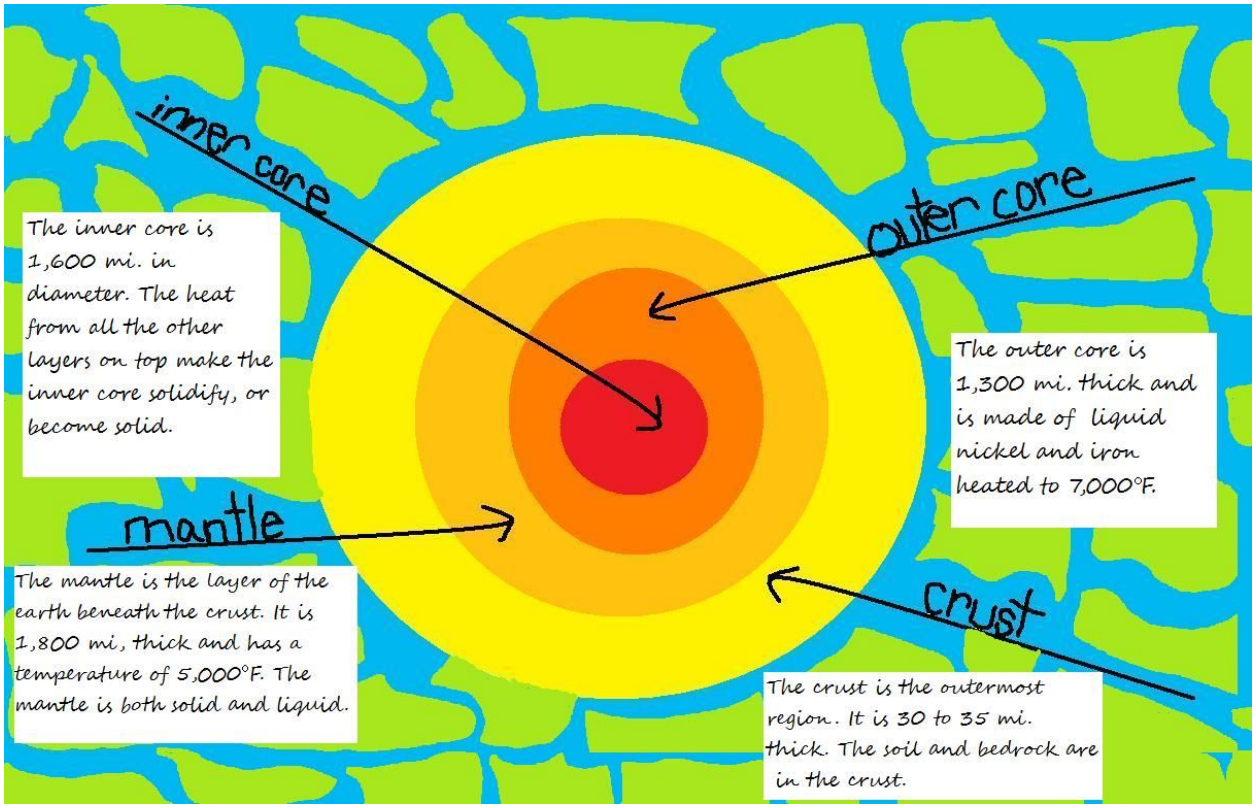
Remember that earth is made up of 4 layers: the crust, the mantle, the outer core and the inner core.

The crust is a layer of solid rock.

The mantle is a layer of solid, HOT rock.

The outer core is a layer of **liquid** metal.

The inner core is **solid** metal.



Earthquakes

An **earthquake** is the shaking and trembling that results from movement of rock underneath Earth's surface, called plate movement.

On average, Magnitude 2 and smaller earthquakes occur several hundred times a day world wide. Major earthquakes, greater than magnitude 7, happen more than once per month. "Great earthquakes", magnitude 8 and higher, occur about once a year.

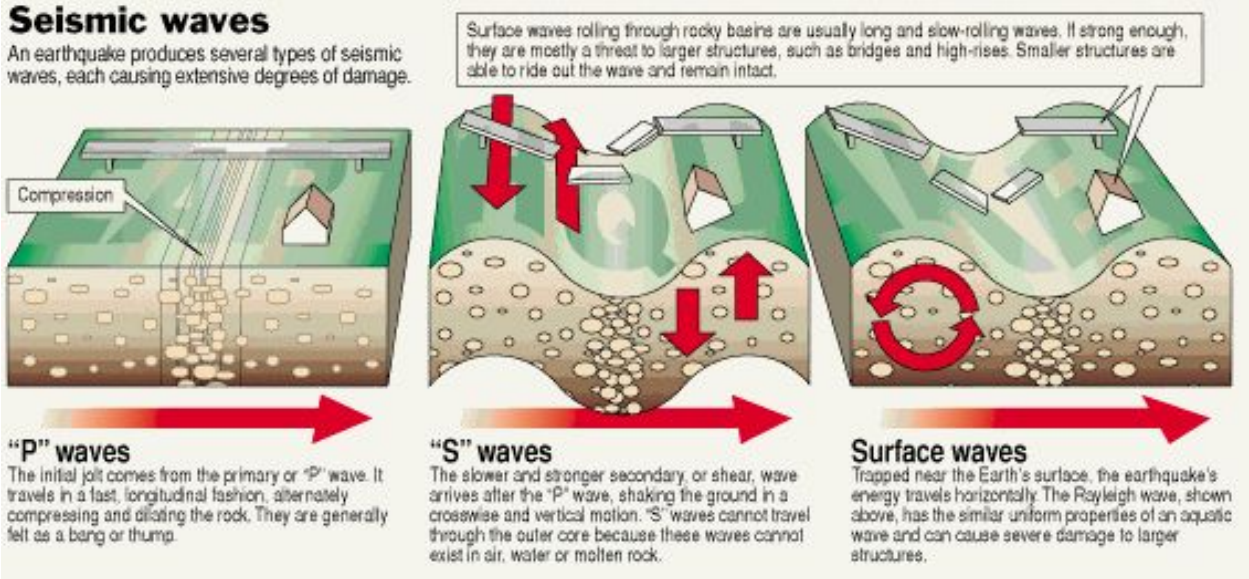
Causes of Earthquakes

The force of plate movement causes earthquakes.

This movement causes **stress** in the crust.. The energy released during an earthquake creates **seismic waves -** vibrations similar to sound waves.

There are 3 types of waves - P (primary) waves, S (secondary) and Surface waves.

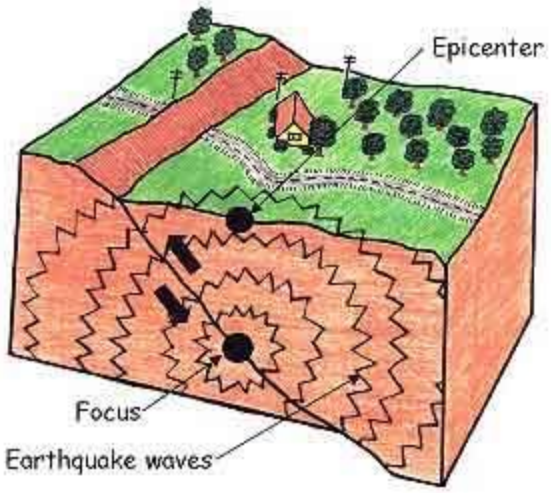
P waves arrive first and they push and pull . They can travel through both liquids and solids.
S waves follow and they move from side to side and cannot move through liquid.
Surface waves happen when P and S waves reach Earth's surface and they move like waves.
Remember our live demonstration to remember how each one moves!!



EPICENTER

The point where the rocks actually break is the earthquake **focus**.

Large subduction (when one plate is pushed under another) zone earthquakes can break along a fault for hundreds of miles. The **epicenter** of these earthquakes is directly above where the earthquake actually started along the fault line.



How Do We Measure Earthquakes?

Scientists use an instrument called a **seismograph** that can record and measure an earthquake's seismic waves.

Geologists measure the amplitude of the highest wave and give a single number to tell what the magnitude of an earthquake is.

The **Richter Scale** is the most common one used to tell us how powerful an earthquake is.

A magnitude of 5 or less means the earthquake is small and doesn't cause much damage. Magnitudes of 6 - 8 are the powerful earthquakes that cause a lot of damage.

Understanding the Richter Scale:

Richter Magnitude	Feels like KG of TNT	Extra Information
0-1	0.6-20 kilograms of dynamite	We can not feel these
2	600 kilograms of dynamite	Smallest Quake people can normally feel
3	20,000 kilograms of dynamite	People near the epicenter feel this quake
4	60,000 kilograms of dynamite	This will cause damage around the epicenter. It is the same as a small fission bomb
5	20,000,000 kilograms of dynamite	Damage done to weak buildings in the area of the epicenter
6	60,000,000 kilograms of dynamite	Can cause great damage around the epicenter
7	20 bilion kilograms of dynamite	Creates enough energy to heat New York city for one year. Can be detected all over the world. Causes serious damage
8	20 bilion kilograms of dynamite	Causes death and major destruction. Destroyed San Francisco in 1906
9	20 trillion kilograms of dynamite	Rare, but would causes unbelievable damage!