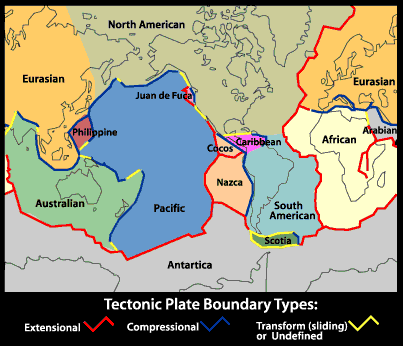
*Use the class notes to complete this study guide.*

Plate Tectonics

* Tectonic plates are composed of oceanic lithosphere and thicker continental lithosphere
* The Earth’s crust is divided into plates. Each Tectonic Plate includes the Upper rigid part of \_\_\_\_ and \_\_\_\_.
* Plates move, because of \_\_\_\_ in the \_\_\_\_ and slab pull.



Tectonic Plate Boundaries

* Where plates meet, their relative motion determines the type of boundary
* \_\_\_\_, \_\_\_\_ activity, \_\_\_\_ building, and oceanic ridge & trench formation occur along these plate \_\_\_\_.

Plate \_\_\_\_ – where two plates are moving away from each other. “Divergent” ← →

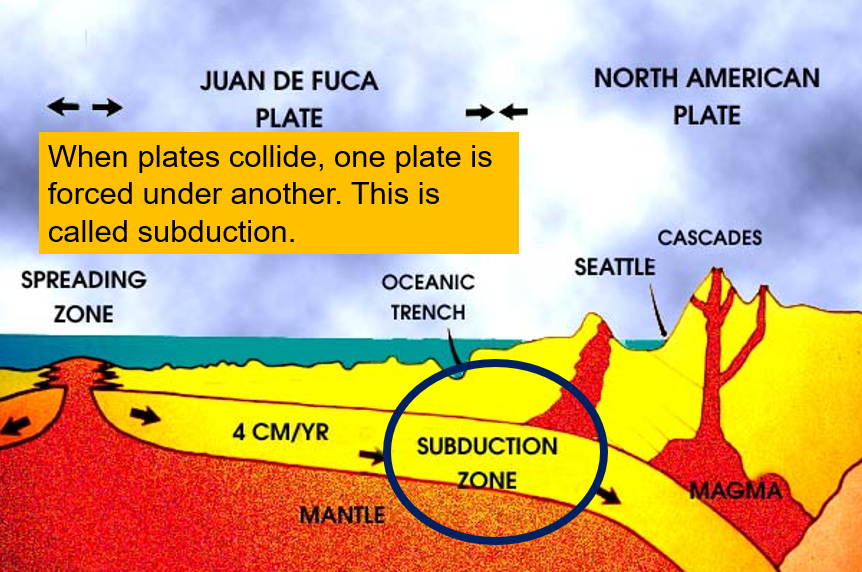
* + Also called “constructive” plate boundary because new crust is created.
  + Typified in the oceanic lithosphere by the rifts of the oceanic ridge system, including the Mid-Atlantic Ridge

Plate \_\_\_\_ – where two plates are moving (sliding) past each other. “Transform” ↑↓

* + San Andreas fault, CA

Plate \_\_\_\_ – where two plates are moving into each other. “Convergent” → ←

* “Convergent” (coming \_\_\_\_) - also called “\_\_\_\_” plate boundary
* Where \_\_\_ plates are moving into each other.
* A result of pressure, friction, and plate material melting in the [\_\_\_\_](http://en.wikipedia.org/wiki/Mantle_(geology)).
* \_\_\_\_ and [\_\_\_\_](http://en.wikipedia.org/wiki/Volcano) are common near convergent boundaries.

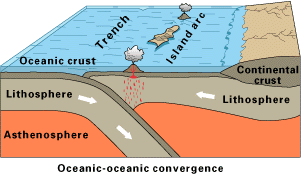


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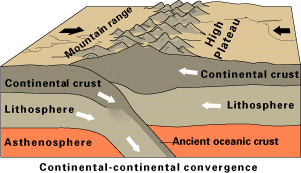


Plate Collision

Oceanic – Continental Subduction 🡪 Ocean plate dives and forms trench and volcanic mountains.



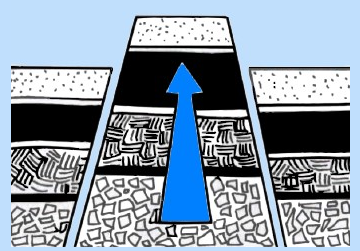
Oceanic – Oceanic Subduction 🡪 A more dense plate will dive and form trench and volcanic island arc.



Continent – Continent 🡪 Continental crust is buoyant (“floats”; does not subduct) so collision builds huge folded mountains.

Types of Mountains

\_\_\_\_ Block



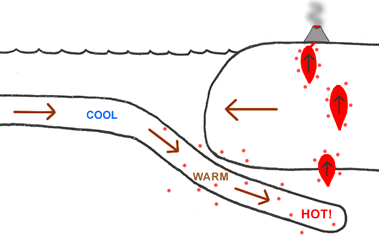
* Faults (\_\_\_\_ *in the earth's crust*) force some materials or blocks of rock up and others down.
* Instead of the earth folding over, the earth's crust fractures (pulls apart). It breaks up into \_\_\_\_ or chunks.
* Sometimes these blocks of rock move up and down, as they move apart and blocks of rock end up being stacked on one another.

\_\_\_\_\_



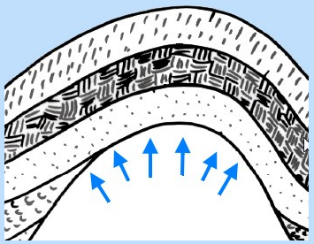
* Form mainly by the [folding](https://en.wikipedia.org/wiki/Fold_(geology)) of rock layers within the upper part of the [Earth's crust](https://en.wikipedia.org/wiki/Earth's_crust).
* When plates and the continents riding on them \_\_\_\_, the accumulated layers of rock may crumple and \_\_\_\_ like a tablecloth that is pushed across a table.

\_\_\_\_\_



* Formed when \_\_\_\_ rock (magma) deep within the earth, erupts, and piles upon the surface.
* Magma is called \_\_\_\_ when it breaks through the earth's crust. When the ash and lava cools, it builds a cone of rock. Rock and lava pile up, layer on top of layer.

\_\_\_\_\_



* Result of a great amount of melted rock (magma) pushing its way up under the earth’s crust.
* Without actually erupting onto the \_\_\_\_, the magma pushes up overlaying rock layers.
* At some point, the magma cools and forms hardened rock.

Earthquakes

* An earthquake is the sudden movement of the earth's crust caused by the release of \_\_\_\_.
* This stress is built up along where two plates are moving past, away, or into one another.
* Earthquakes can also occur within a plate along cracks called \_\_\_\_, but most earthquakes occur along plate \_\_\_\_.

\_\_\_\_ Rebound

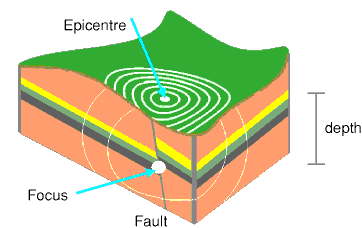
* Any place where movement occurs along a crack in the earth’s crust, this is called a fault.
* Faults can build up energy (stress), until the energy stored is greater than the strength of the rock itself, and the rock “\_\_\_\_” to a rest position.
* This is known as elastic rebound, and this is how earthquakes occur.

Faults (cracks in the earth’s crust)

* \_\_\_\_ fault 🡪 one tectonic plate slips down
* \_\_\_\_ fault 🡪 one tectonic plate rises up
* \_\_\_\_ \_\_\_\_ fault 🡪 two tectonic plates slide side by side in opposite directions

\_\_\_\_ - the place on the surface of the earth directly above where the earthquake occurred.

\_\_\_\_ – the place where the greatest amount of slippage occurred. Label the boxes:



?

?

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\_\_\_\_ - the changing of speed and direction of a wave due to change in medium.

The arrival of seismic waves around the earth at different times indicate there are different \_\_\_\_ in our planet.

Locating an Earthquake

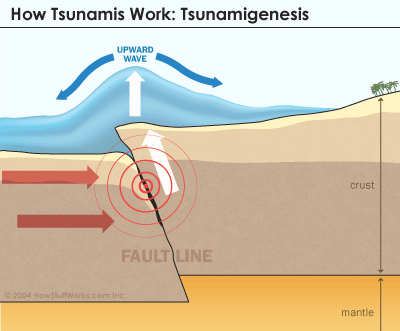
* Information from \_\_\_\_ seismic stations are necessary to pin point the location of an earthquake.
* Using the difference in \_\_\_\_ time between the \_\_\_ and \_\_\_ wave arrival, a distance can be determined for each station.
* Once the three stations distances are plotted on a map, their intersection is the \_\_\_\_.
* Epicenters are most often along tectonic plates \_\_\_\_.

\_\_\_\_ Scale

* The most common way that earthquakes are reported, but the majority of seismologists use the moment magnitude.
* The Richter Scale rates the \_\_\_\_ of earthquakes from 0 to 10 using the wave amplitude of the largest wave, and a logarithmic equation.
* Each Richter number is approximately \_\_\_ TIMES greater. E.g. “2” is 32 times more energy; “3” is 32 x 32 or 1024 times more energy; “4” is 32 x 32 x 32 or 32,768 times more energy, etc.

\_\_\_\_

* A wave generated by an off shore \_\_\_\_, or when large amounts of material fall into the ocean.



Volcanoes

\_\_\_\_ Volcanoes

* Large, \_\_\_\_ slope. Relatively \_\_\_\_ eruptions. Low viscosity magma.
* [i.e. Mauna Loa, Olympus Mons (Mars)]
* Usually built almost entirely of fluid lava flows. They are named for their large size and low profile, resembling a warrior’s shield lying on the ground.

\_\_\_\_ Volcanoes

* Conical with a concave shape that is \_\_\_\_ near the top.
* Large volcanoes (many thousands of feet or meters \_\_\_\_) generally composed of lava flows, pyroclastic deposits, and mudflow (lahar) deposits, as well as lava \_\_\_\_.

\_\_\_\_ Cone Volcanoes

* \_\_\_\_, steep sided, composed mostly of ash. Medium to High Viscosity.
* [i.e. Paracutin (Mexico), Sunset Crater (Az)]

Volcanic Eruptions

Volcanic \_\_\_

* A mixture of rock, mineral, and glass particles expelled from a volcano during a volcanic eruption.
* The particles are very \_\_\_ – less than \_\_\_ millimeters in diameter.
* They tend to be pitted and full of holes, which gives them a \_\_\_ density.

Volcanic \_\_\_

* Also known as \_\_\_ bombs.
* Pieces of partially \_\_\_\_ lave that are ejected from a volcano.
* Range in size from a few centimeters to several meters in diameter, but larger than \_\_ centimeters.

Volcanic \_\_\_

* A fragment of rock, that measures more than 64 centimeters in diameter and is erupted in a \_\_\_\_ condition.
* Mostly accidental in nature.

\_\_\_\_ of Fire

* A large number of \_\_\_\_ and \_\_\_\_ eruptions occur in the basin of the \_\_\_\_ ocean.
* In a 40,000 km (25,000 mi) horseshoe shape, it is associated with a nearly continuous series of oceanic \_\_\_\_, \_\_\_\_ arcs, and [volcanic belts](http://en.wikipedia.org/wiki/Volcanic_belt) and/or \_\_\_\_ movements.
* It has 452 volcanoes and is home to over \_\_\_% of the world's active and dormant volcanoes.