

Earth Science

Earthquakes

Volcanoes

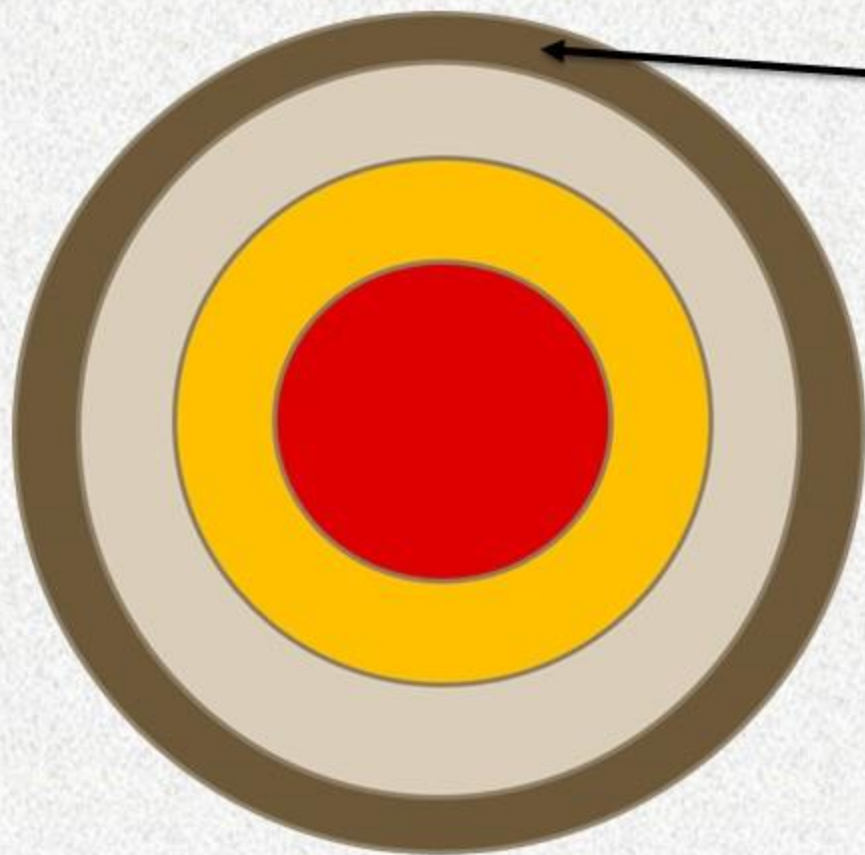


Layers of the Earth

Layers of the Earth

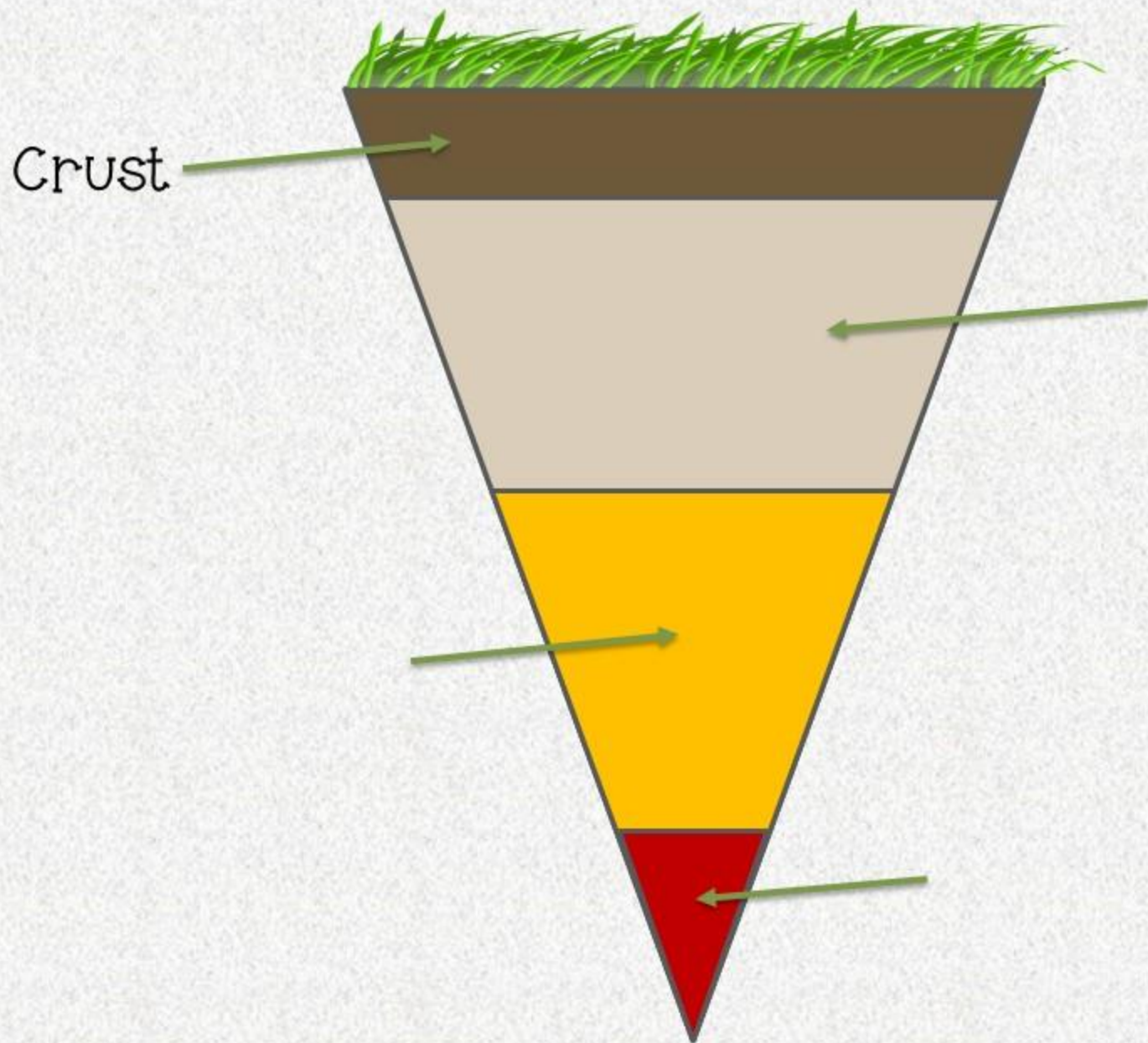


The Crust



The crust of the Earth is the outer layer

- Composed mainly of rock
- 25 miles deep under the continents (thinnest layer of the Earth)



The Crust

- The crust is broken into large pieces that move slowly.
 - These are called plates.
 - These plates move because of temperature differences inside the Earth.
 - <http://safeshare.tv/w/eZHiPpXRhb>



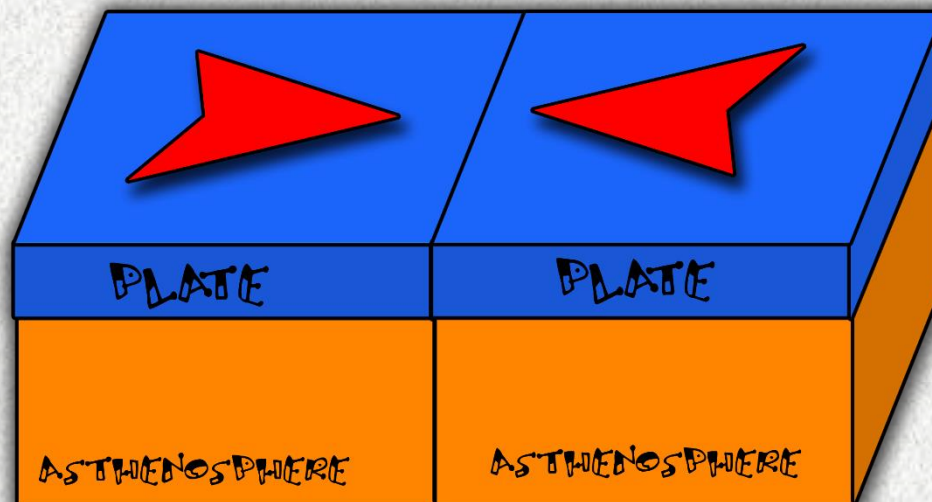
The Crust

- The plates can push against each other, move away from each other or move past each other.
 - Volcanoes, earthquakes, and mountains form along the plate boundaries



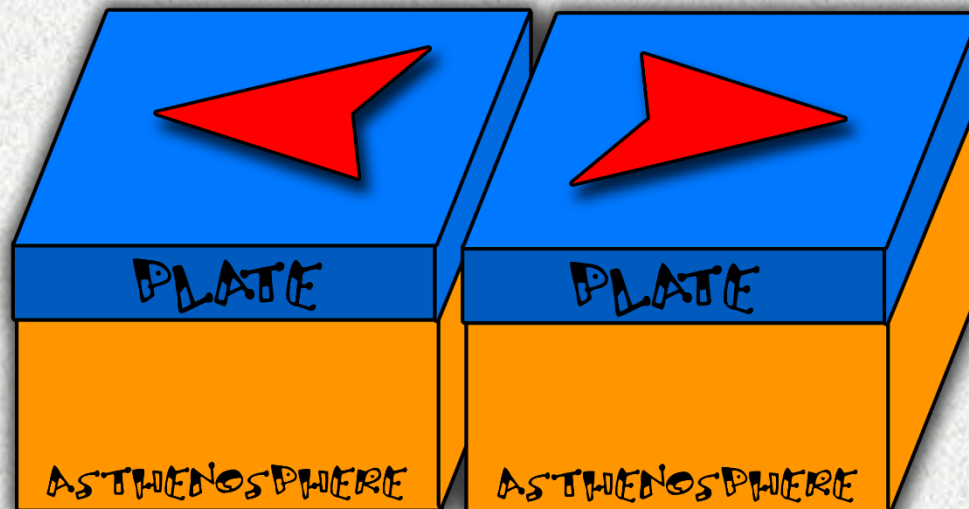
Convergent Boundaries

- CONVERGE = to come together
- Convergent Boundaries – when two plates come together and push against each other, they form mountains!
- [http://sepuplhs.org/middle/iaes/students/simulations/SEPUP Plate simulation.swf](http://sepuplhs.org/middle/iaes/students/simulations/SEPUP_Plate_simulation.swf)



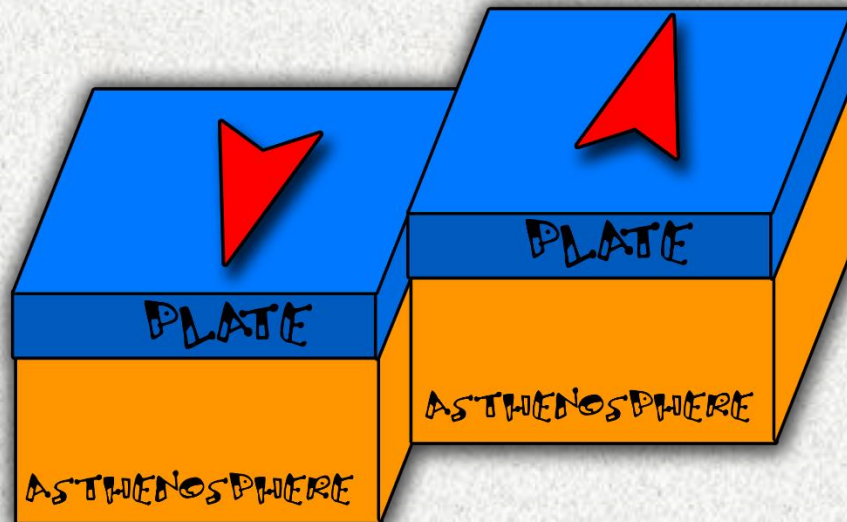
Divergent Boundaries

- **DIVERGE** = to move apart
- Divergent boundaries - when two plates **move apart**. This mostly happens in oceans, and they form volcanoes.
- [http://sepuplhs.org/middle/iaes/students/simulations/SEPUP Plate simulation.swf](http://sepuplhs.org/middle/iaes/students/simulations/SEPUP_Plate_simulation.swf)

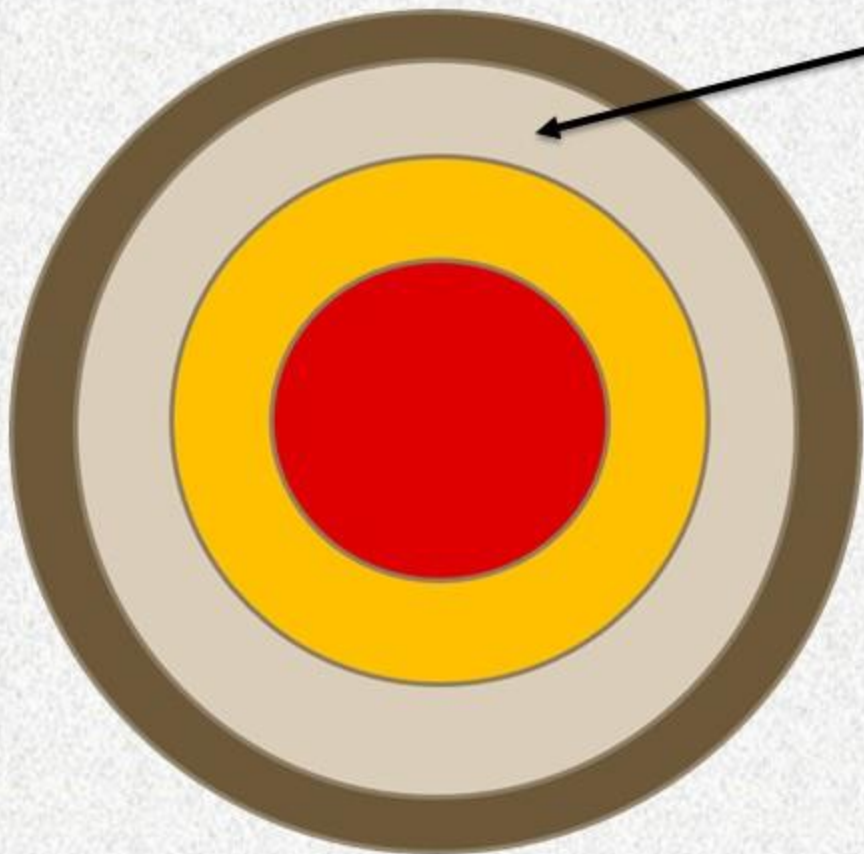


Transform Boundaries

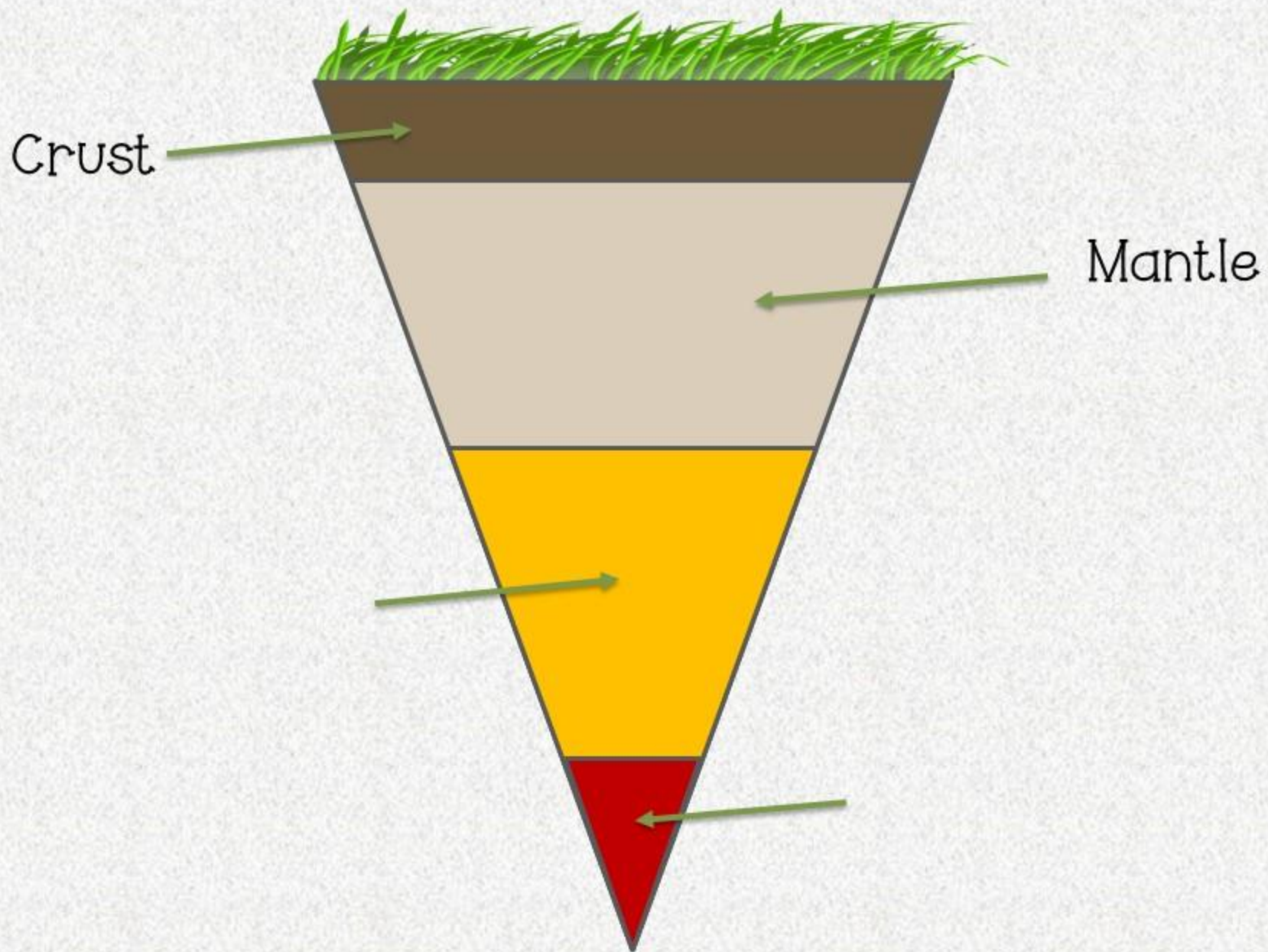
- Transform Boundaries – when two plates **slide past** each other
- A large amount of energy is built up as boundaries slide past each other, and this often causes earthquakes
- [http://sepuplhs.org/middle/iaes/students/simulations/SEPUP Plate simulation.swf](http://sepuplhs.org/middle/iaes/students/simulations/SEPUP_Plate_simulation.swf)



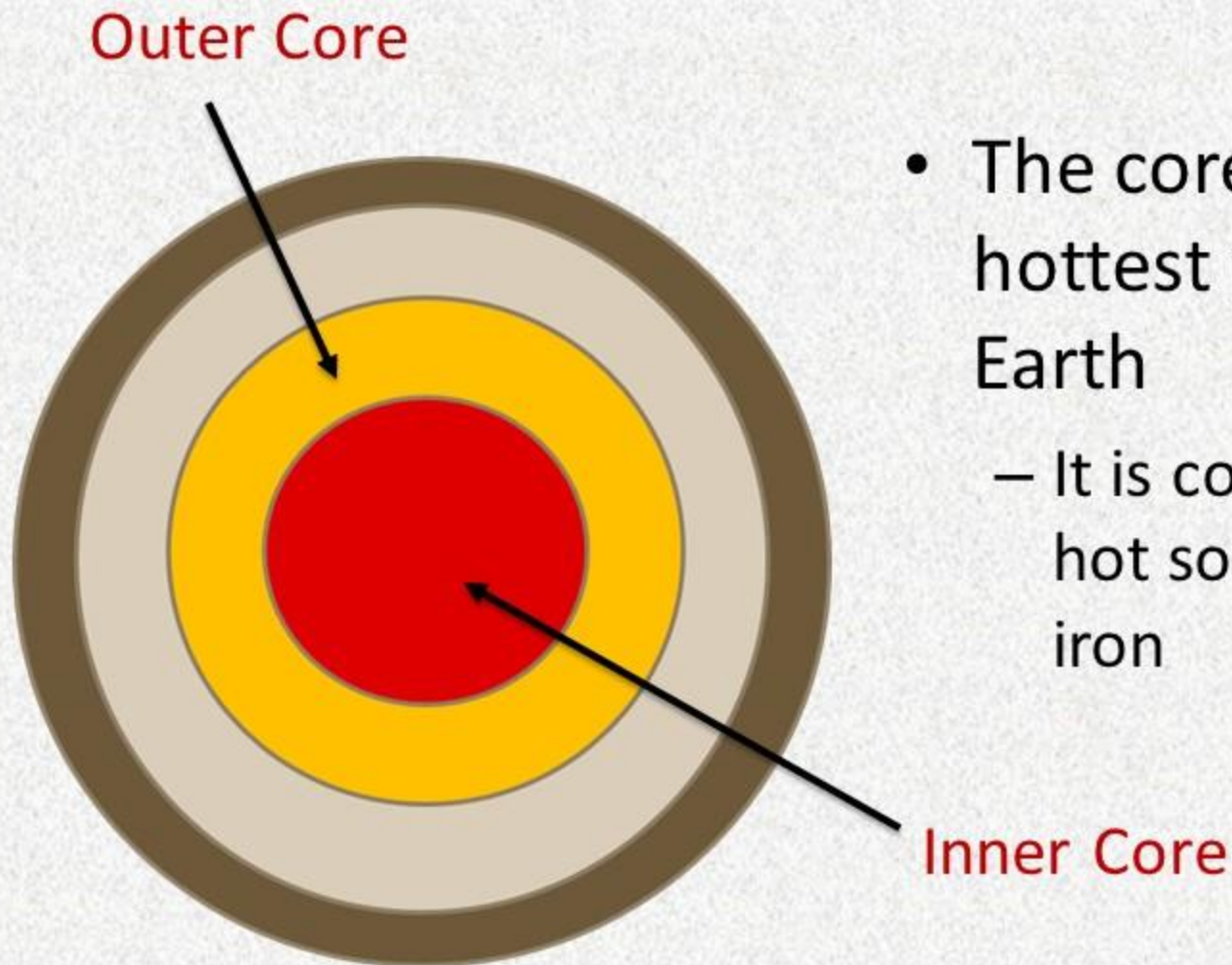
The Mantle



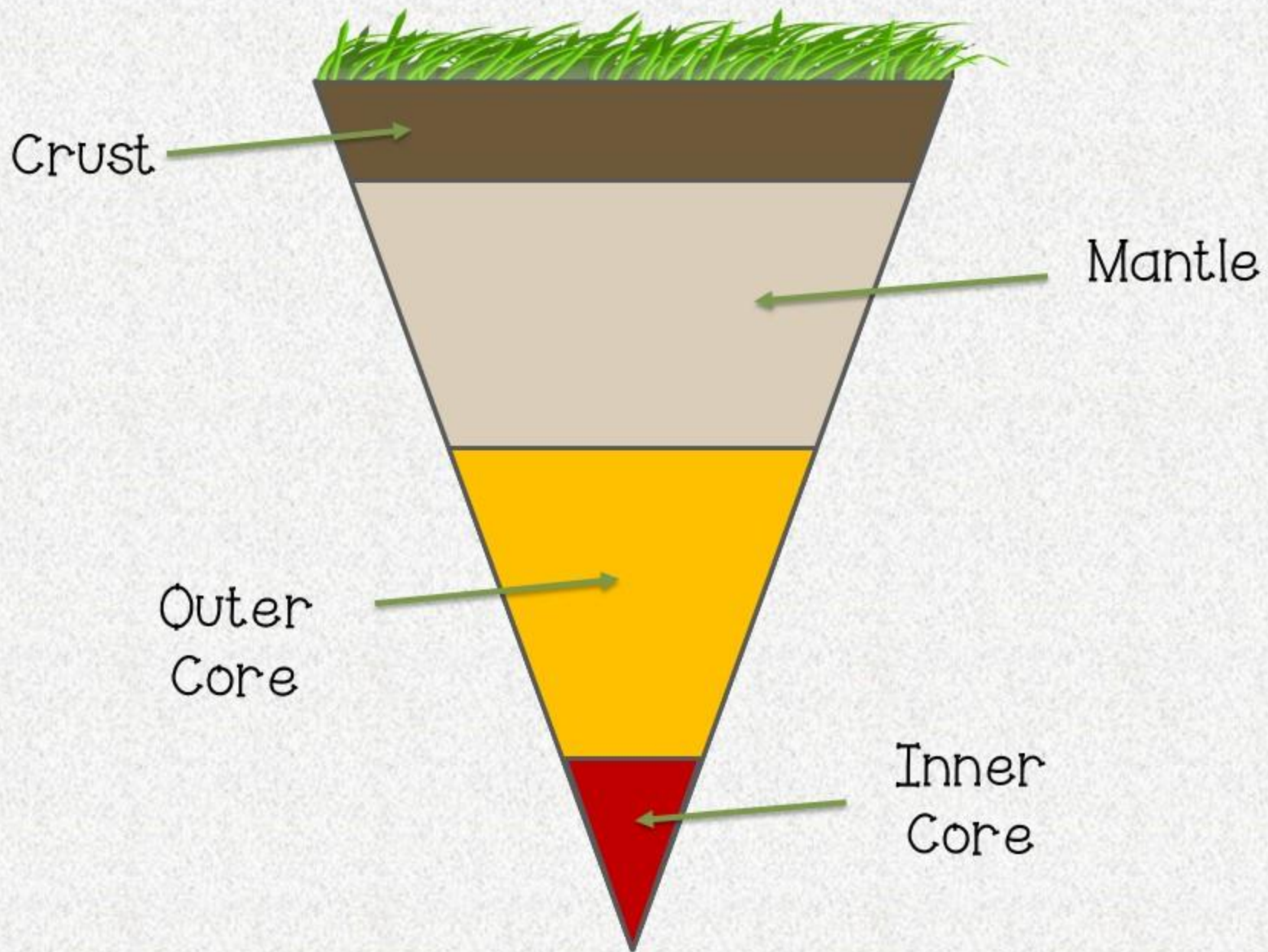
- The mantle is the Earth's middle layer
 - VERY hot and under great pressure
 - Made of solid rock and melted rock
 - 1,789 miles thick



The Core



- The core is the hottest part of the Earth
 - It is composed of hot solid nickel and iron



The Earth's Layers are like an...



Structure of the Earth

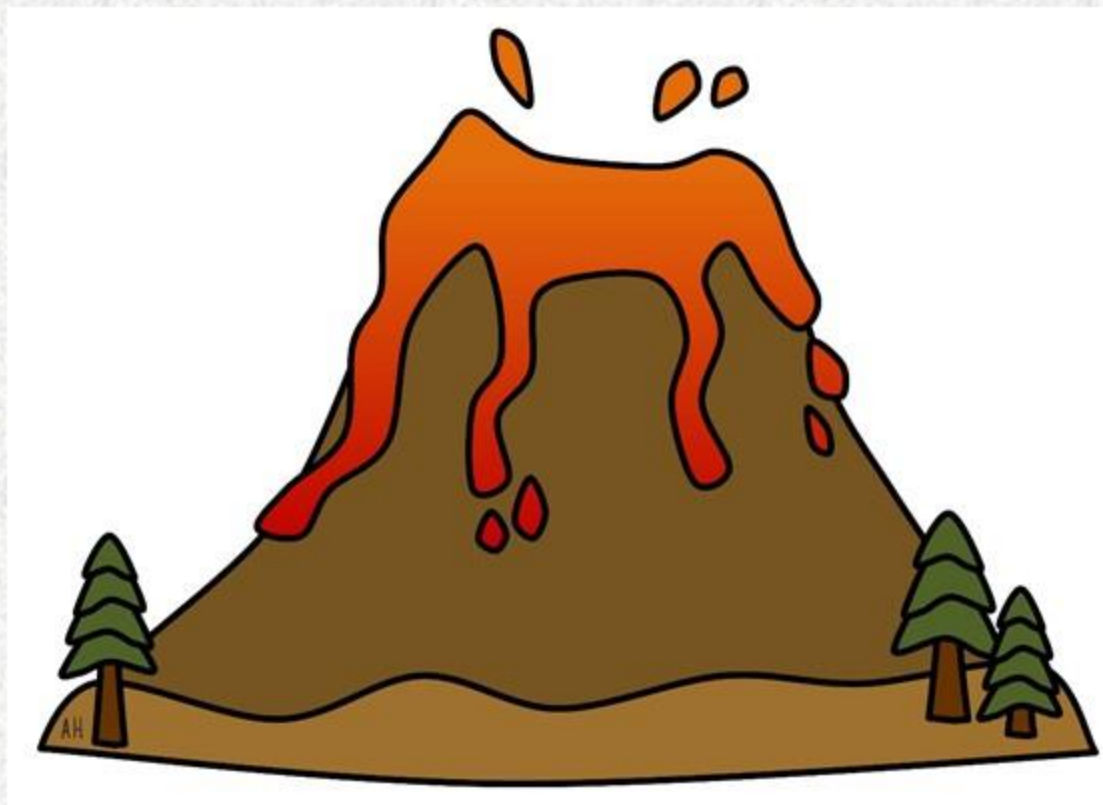
<http://safeshare.tv/w/qhMpgkxknR>

Extra Links

<http://www.brainpop.com/science/earthsystem/earthsstructure/>

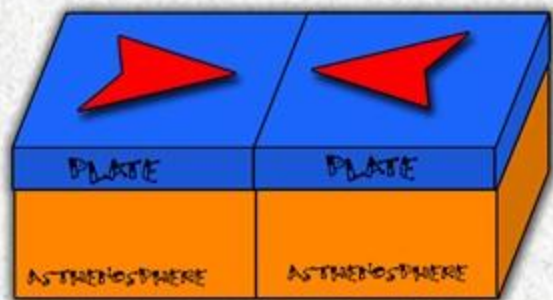
<http://www.brainpop.com/science/earthsystem/platetectonics/>

Earthquakes and Volcanoes

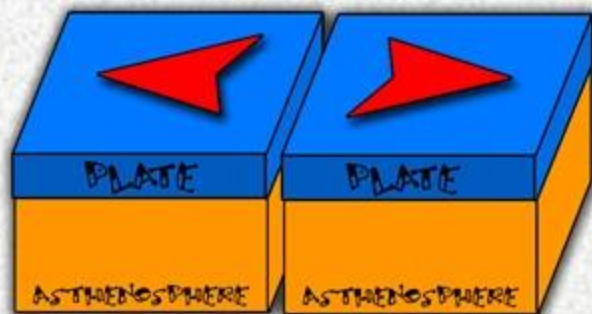


Earthquakes

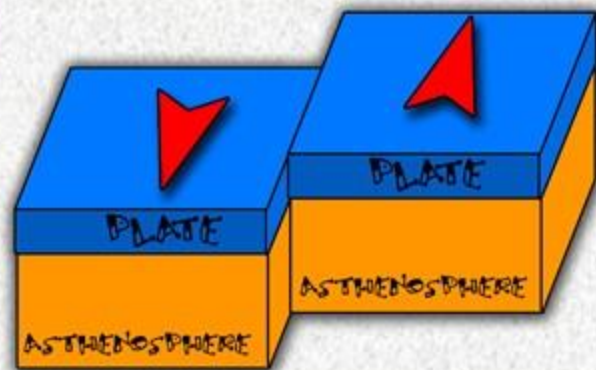
- We know that the Earth has about 20 plates that move toward, past, or against each other



Convergent
Boundaries form:



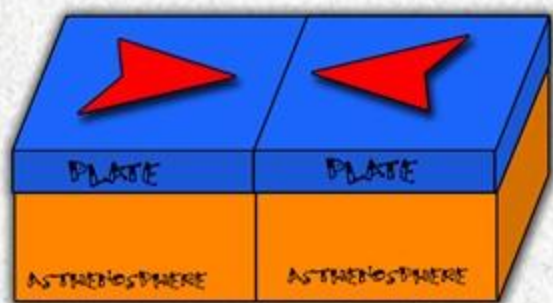
Divergent
Boundaries form:



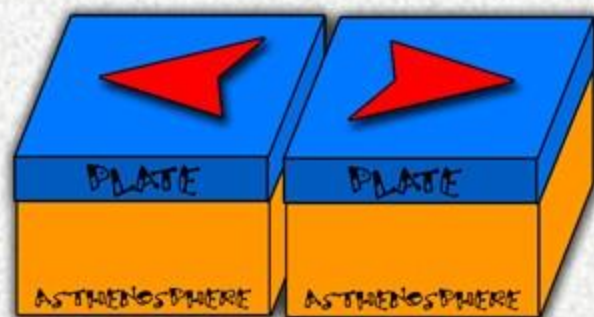
Transform
Boundaries form:

Earthquakes

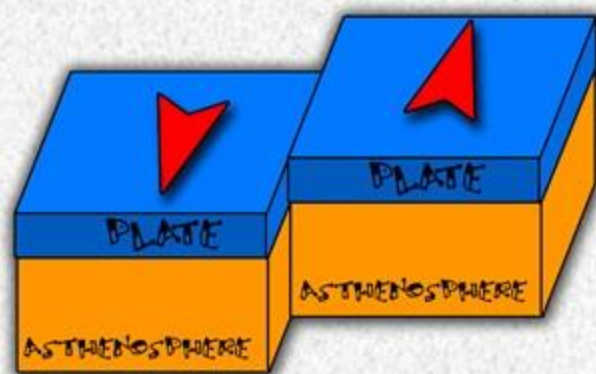
- We know that the Earth has about 20 plates that move toward, past, or against each other



Convergent
Boundaries form:
mountains



Divergent
Boundaries form:
volcanoes



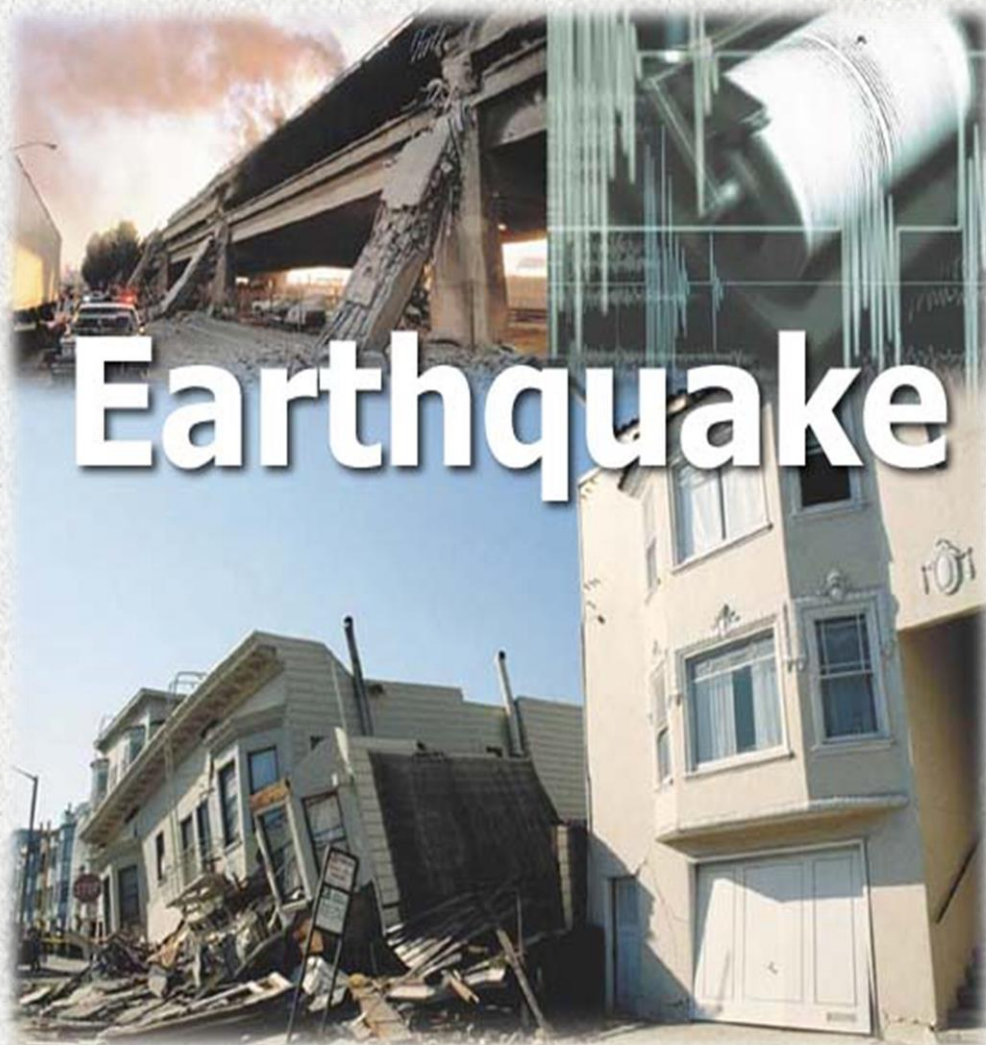
Transform
Boundaries form:
earthquakes

Earthquakes

- When the plates slide past each other, huge rocks that form at their edges shift with great force, which creates a crack in the Earth's crust
- An earthquake is caused by a break in the rock that makes up Earth's crust. This is called a **fault**.
- <http://www.iknowthat.com/mhscience/Earthquakes/Fixed.htm>



Earthquake Activity



Earthquakes are both destructive and constructive!









Earthquakes are **Constructive**:



A fault line in the Earth's crust can be the location of a new landform.

An earthquake can push one side up causing a fault scarp.

Earthquake Activity

When an earthquake shifts the rock at a fault, a section of land can be moved several feet up, or a mountain range can be raised a few inches.



Changes Caused by Earthquakes

- Earthquakes occur when the Earth's crust shifts at a fault
 - Pieces of one side of a fault can be pushed up in relation to land on the other side
 - The faults form large trenches and cliffs on the Earth

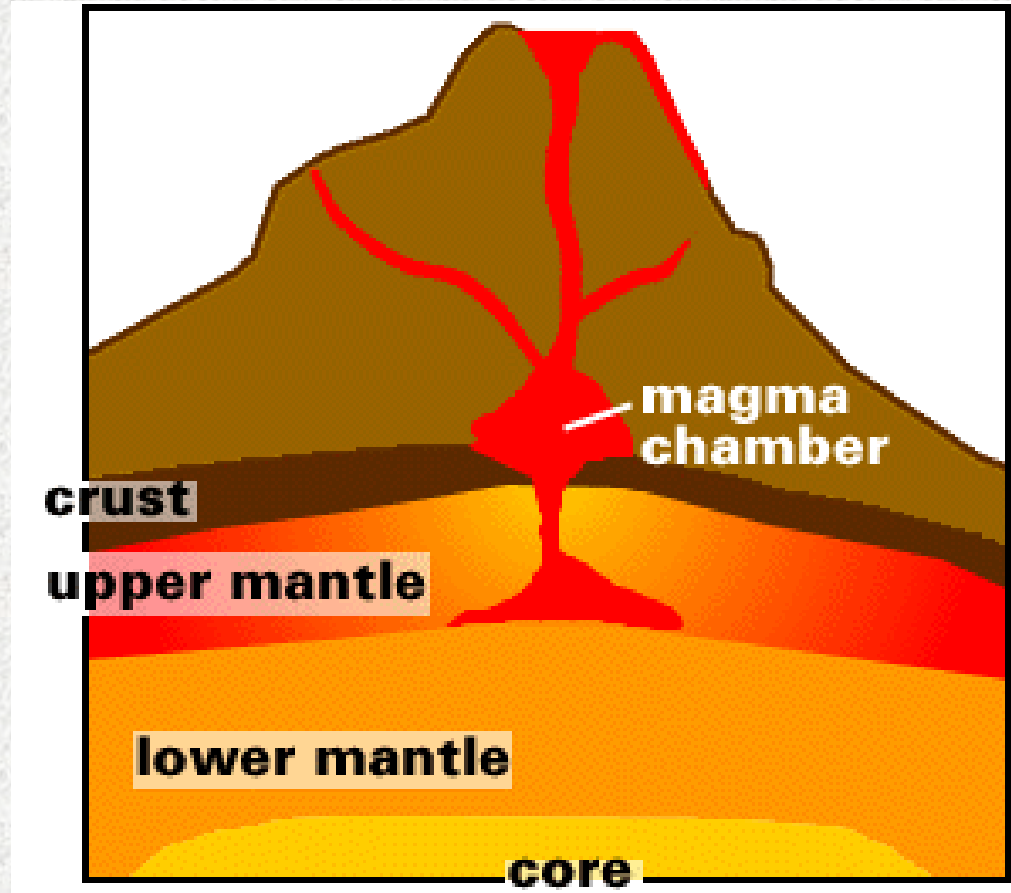


Earthquakes

- <http://www.pbs.org/wnet/savageearth/animations/earthquakes/index.html>
- <http://www.brainpop.com/science/earthsystem/earthquakes/>

Volcanoes

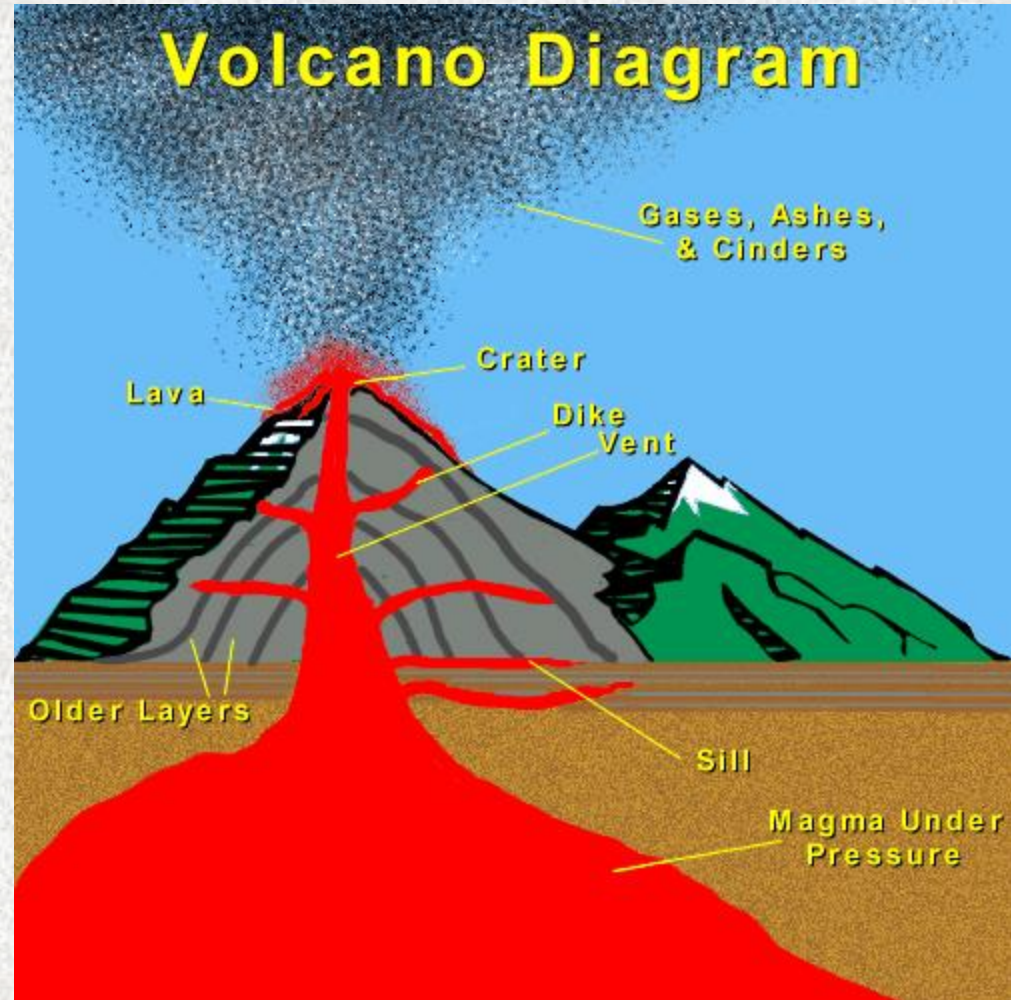
- In the Earth's mantle, there are pockets of hot, liquid-like rocks and gases called **magma**.
- As heat and pressure builds up in these pockets (chambers) the gases expand.



Volcanoes

- The increasing pressure forces the magma up the volcano's pipe and out the opening of the volcano (crater).
- Once the magma reaches the surface of the Earth it is called **lava**.
- Once all the pressure is released, the volcano stops erupting.

<http://kids.discovery.com/games/pompeii/pompeii.html>



Volcanic Activity



Volcanoes are both constructive and destructive forces that change the Earth's surface.

Constructive



They can “add to”
the landforms of
mountain ranges
and...

Volcanic Activity

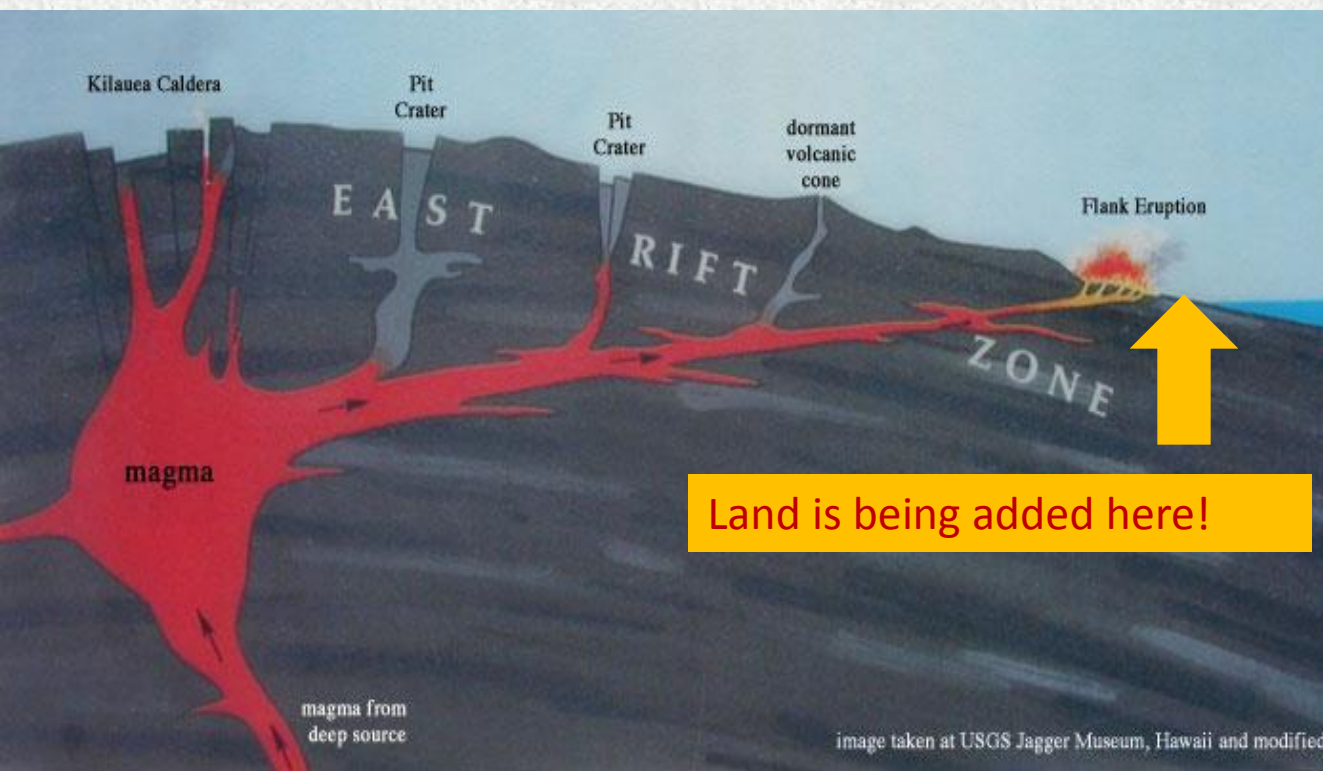
create
islands in the
middle of
the ocean.





Hawaii's Kilauea Volcano

This volcano has been erupting continuously since January 1983. Lava is pouring down the edge of the island and into the ocean, becoming solid rock.



Hawaii's Kilauea Volcano



- This “new land” has been growing and extending the edge the Hawaiian Islands and into the ocean each year.

Effects of Volcanoes and Earthquakes

- Scientists cannot control volcanic eruptions and earthquakes
 - However, they can warn people when they believe they are most likely to occur



Predicting Earthquakes and Volcanoes

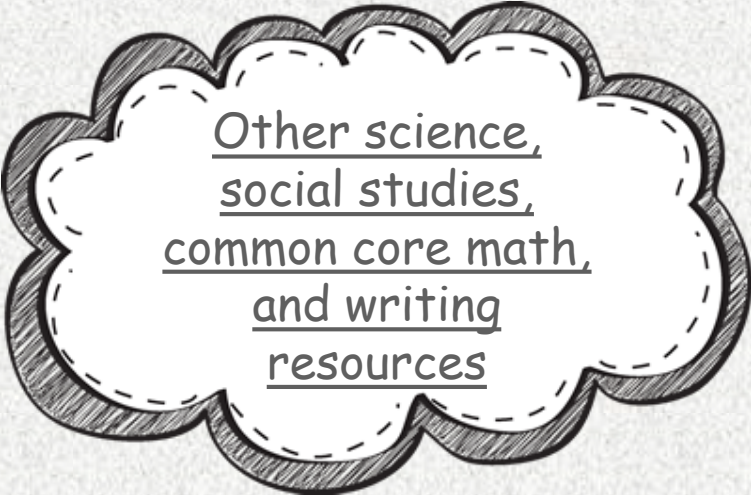
- Devices called seismographs can detect vibrations during an earthquake.
 - Seismologists study seismic waves
 - The record made by a seismograph is called a seismogram
- <http://www.teachersdomain.org/resource/ess05.sci.ess.earthsys.seismograph/>
- <http://www.scholastic.com/browse/article.jsp?id=4892>

Using Science and Technology to Keep People Safe

- Seismographs also help scientists predict when tsunamis and volcanoes will occur
- **Tsunami** – a huge wave caused by an earthquake under the ocean
 - Seismographs watch for underwater earthquakes to predict when one will occur
- <http://www.whoi.edu/home/interactive/tsunami/indexEnglish.html>

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common core math,
and writing
resources

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