

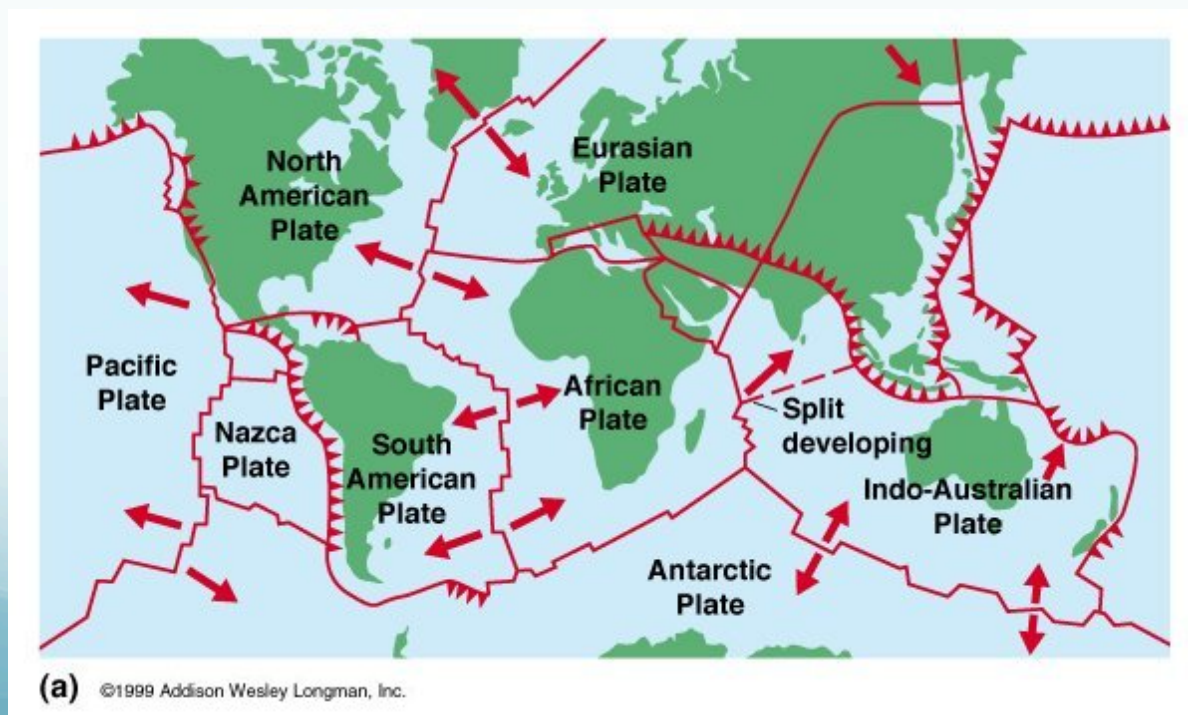
Earthquakes, Volcanoes, and Plate Tectonics

Chapter 11 Section 3

SPI 0707.7.6 Describe the relationship between plate movements and earthquakes, mountain building, volcanoes, and sea floor spreading.

Earth's Moving Plates (the BIG idea)

- The movement of Earth's plates can cause vibrations known as _____ or create conditions in which volcanoes form.
- https://www.youtube.com/watch?v=1-HwPR_4mP4



Where Volcanoes Form

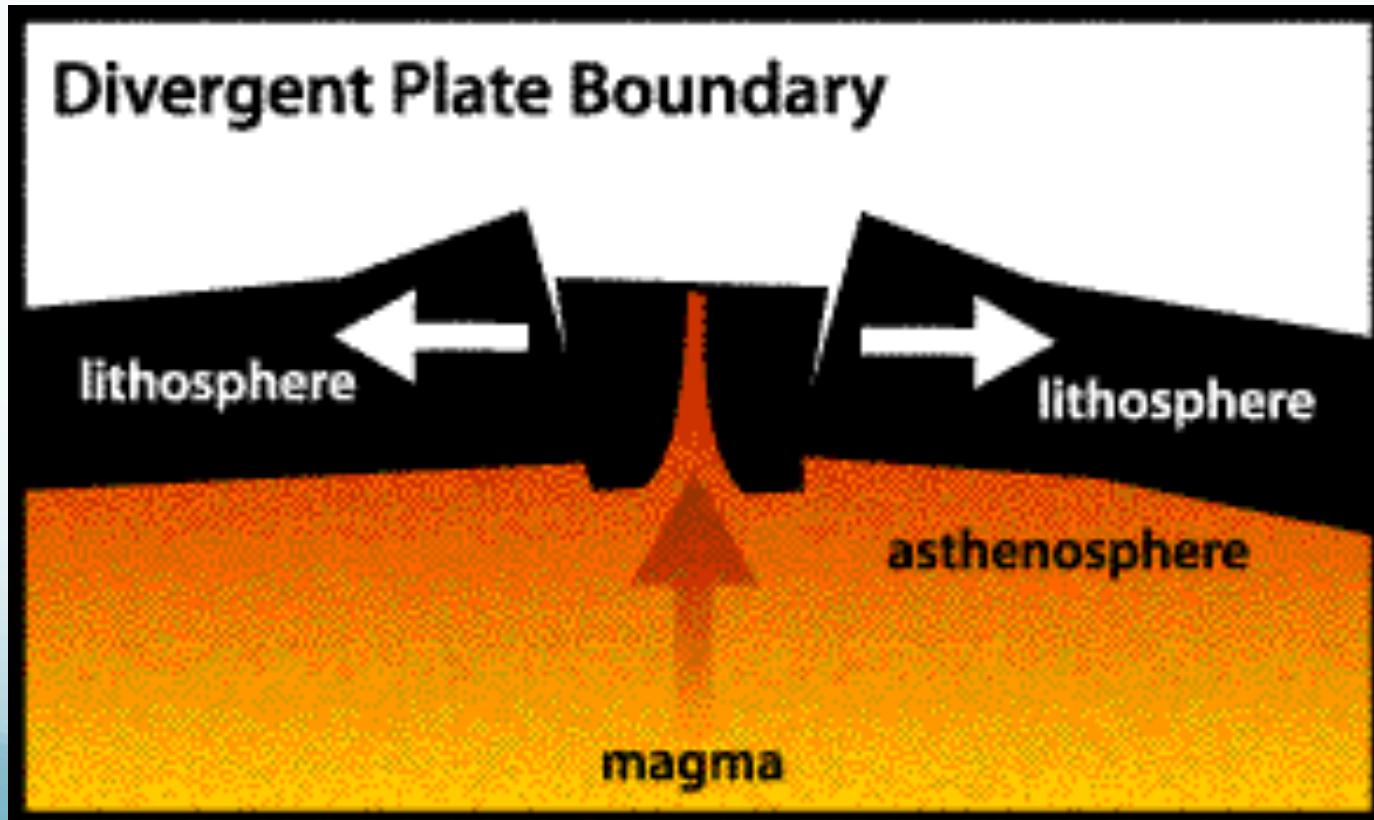
- Most volcanoes form along plate boundaries.
- <https://www.youtube.com/watch?v=jRfEGvp6wDU>

Where Volcanoes Form

- Divergent Plate Boundaries
 - When plates move _____, rifts form between them.
 - A rift is a long crack.
 - Fractures in the rifts serve as _____ for magma coming from the mantle.
 - When lava flows on Earth, it's usually happening in a _____.
 - Fissure eruptions often happen in rift zones. These eruptions form lava that cools and solidifies into basalt.

Where Volcanoes Form

- Divergent Plate Boundaries
 - I need three volunteers!

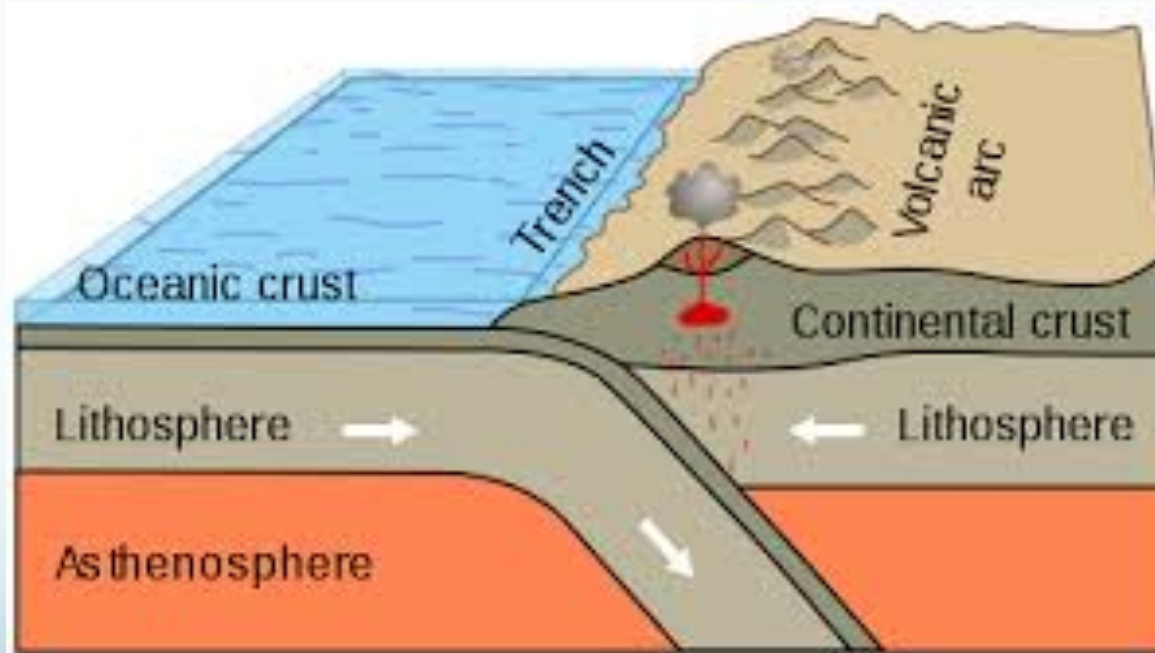


Where Volcanoes Form

- Convergent Plate Boundaries
 - More dense oceanic plates _____ beneath less dense plates they collide with. This is a perfect place for a volcano to form.
 - When a plate sinks beneath another, sediment on an oceanic plate move down into the _____.
 - Water from the sediment lowers the melting point of the surrounding rock.
 - Heat in the mantle causes part of the sinking plate and overlying mantle to _____.
 - This melted material is forced upward.

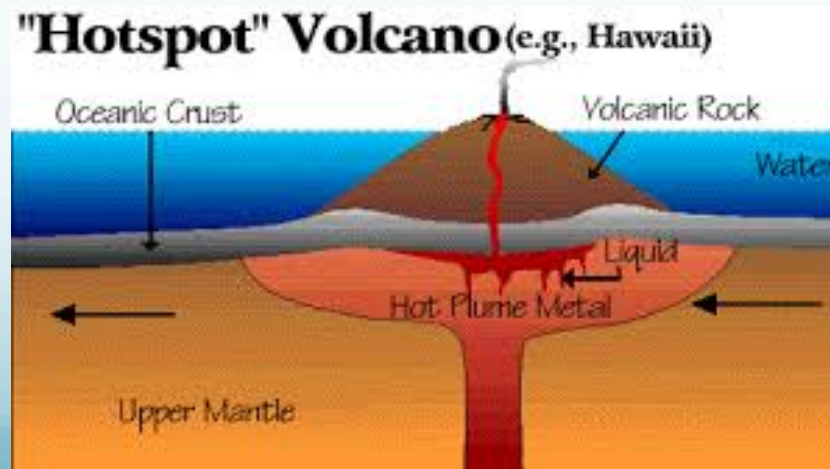
Where Volcanoes Form

- Convergent Plate Boundaries



Where Volcanoes Form

- Hot Spots
 - Large bodies of _____, called hot spots are forced upward through Earth's mantle and crust.
 - Scientists think that this is what is occurring at a hot spot that exists under the present location of Hawaii.
<https://www.youtube.com/watch?v=bYv6V5EJAKc>



SILENTLY! Get out your white board.

- Where does magma along divergent boundaries originate?
- The mantle
- What is a hot spot?
- Bodies of magma forced upward through Earth's mantle and crust that are not necessarily part of a plate boundary.
- Along what type of boundary has the Soufriere Hills volcano formed?
- Convergent boundary with one oceanic plate sinking below the other.
- How did volcanoes in Hawaii form?
- Hot magma is forced upward through Earth's mantle and crust, forming a hot spot.

Journal Reflection

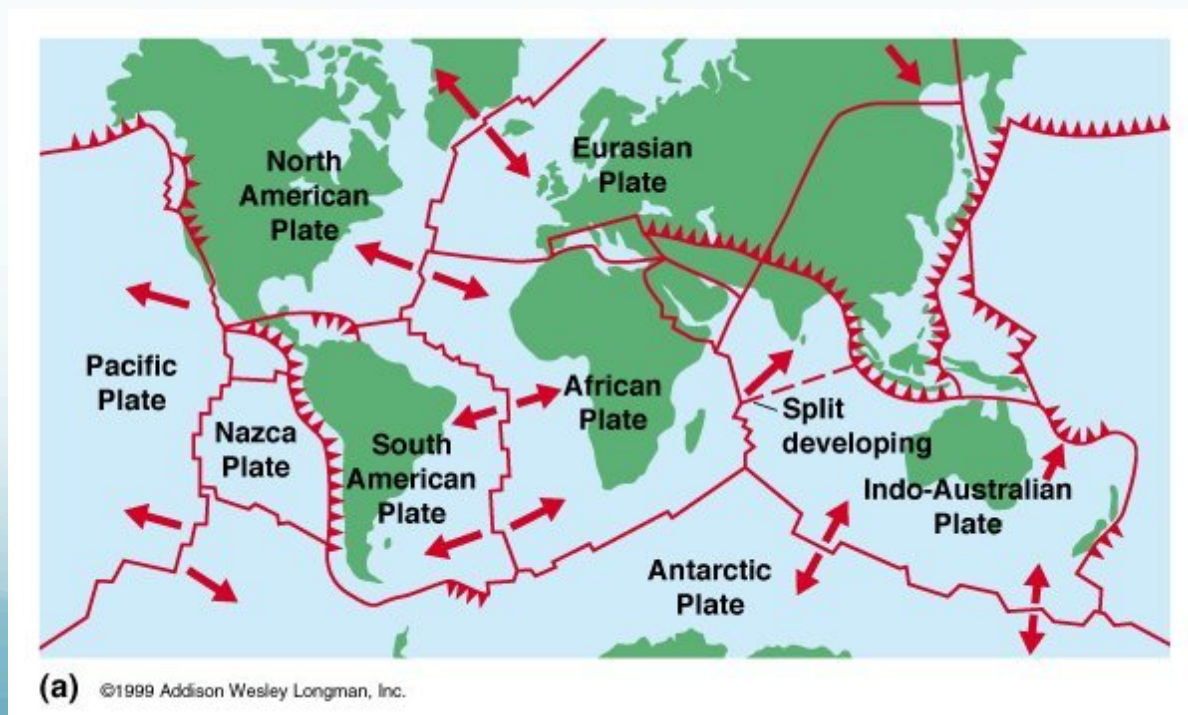
- Subduction occurs where plates converge. This causes water-rich sediment and altered rock to be forced down to great depths. How can this help form a volcano?
- As ocean sediment sinks into Earth's mantle, water travels along with it. The pressure of water vapor in mantle rock lowers the melting point of the rock. The lowered melting point helps to form some magma. Magma is forced upward, reaches Earth's surface, and flows out as lava.

Earthquakes, Volcanoes, and Plate Tectonics

- **Chapter 11 Section 3**
- **SPI 0707.7.6** Describe the relationship between plate movements and earthquakes, mountain building, volcanoes, and sea floor spreading.
- Why do we need to know?
- Why do most "deep" earthquakes occur at convergent boundaries?

Earth's Moving Plates (the BIG idea)

- The movement of Earth's plates can cause vibrations known as earthquakes or create conditions in which volcanoes form.
- https://www.youtube.com/watch?v=1-HwPR_4mP4



Where Volcanoes Form

- Yesterday, we talked about volcanoes.
- Let's review.
- https://www.youtube.com/watch?v=6Z4as_imJfM
- On your white board, write down one thing you have learned about volcanoes.

Now, let's talk about...

- EARTHQUAKES!
- <https://www.youtube.com/watch?v=CtBXTvtFaCU>
- Why do we need to know about earthquakes?

Demonstration

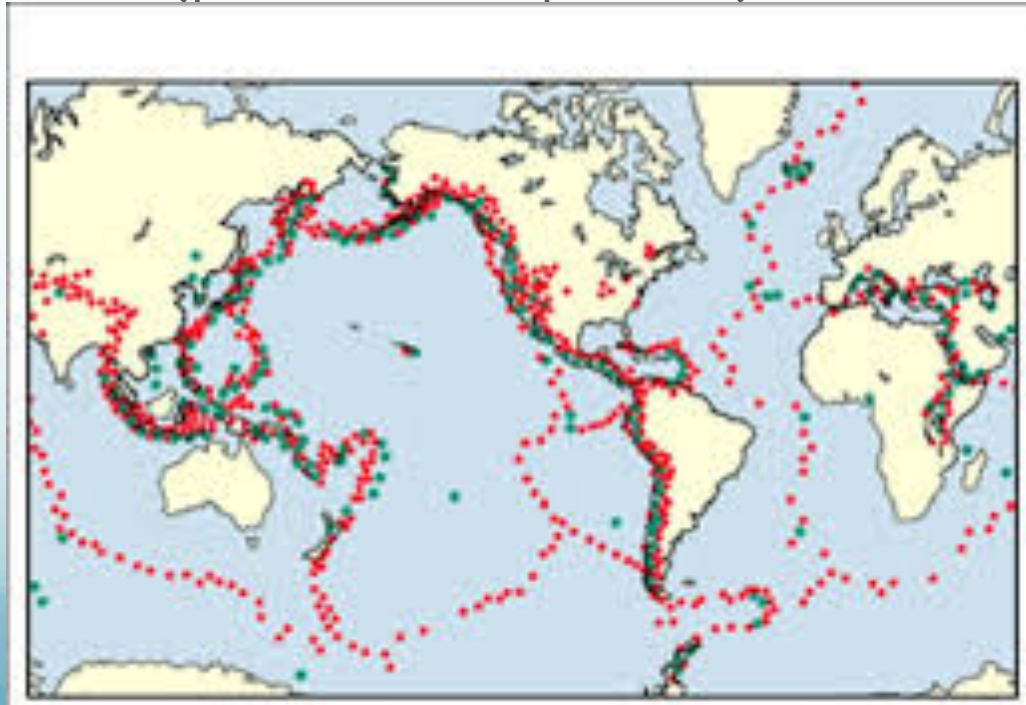
- At your table, get out two notebooks. (They can be your journals.)
- Place them with the page edges facing each other.
- Push them together slowly.
- 1 - What happens?
- 2 - What if this happens to tectonic plates?

Moving Plates Cause Earthquakes

- Earthquakes often occur...
 - where tectonic plates _____ at a convergent boundary
 - where tectonic plates move apart a _____
 - where tectonic plates grind past each other, called a _____
- https://www.youtube.com/watch?v=PwtFuG_M4EE

Earthquake Locations

- 80% of earthquakes happen in the Pacific _____
_____. (The same place many volcanoes occur.)
- Look at figure 15 and 17 to see the relationship between earthquake epicenters and tectonic plate boundaries. (p. 345 and p. 347)

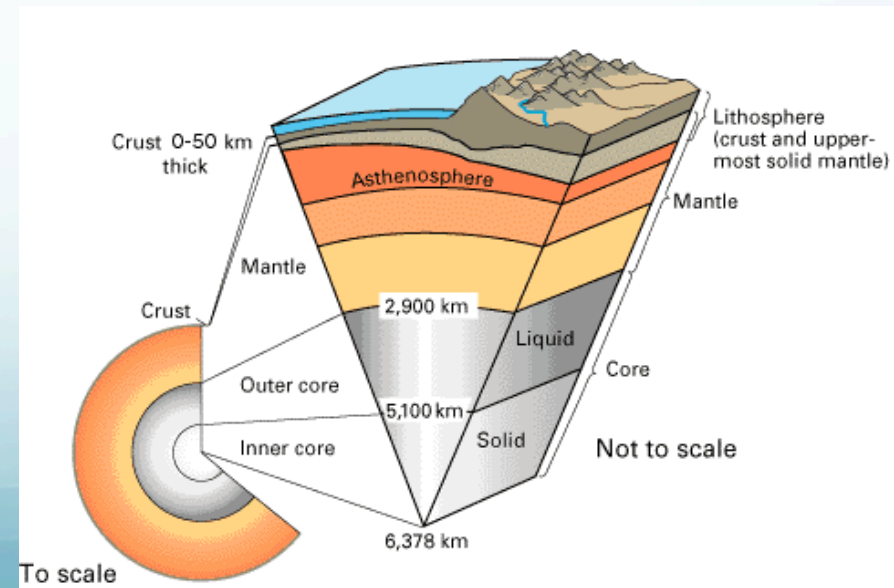


Earth's Plates and Interior

no need to write, just listen and discuss

- From studying seismic waves, scientists have learned much about Earth's interior.
- Seismic wave speeds, and how they travel through different levels in the interior allow scientists to map out the major layers of Earth.
- Example: Scientists discovered the asthenosphere when seismologists noted that seismic waves slowed when they reached the base of the lithosphere. WHY?

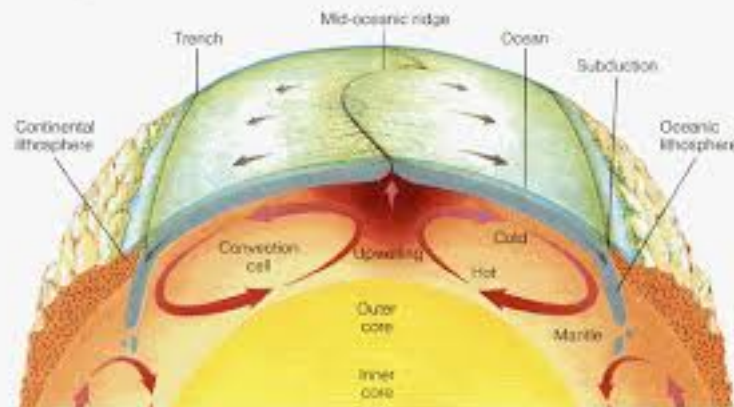
(Page 348)



What is driving Earth's Plates?

no need to write, just listen and discuss

- Mantle material is heated by Earth's core. This hot, less dense rock material is forced toward the surface. The hotter, rising mantle material eventually cools and sinks. Convection currents inside Earth provide the mechanism for plate motions, which then produces the conditions that cause volcanoes and earthquakes.



Silently! Get out your white board!

- Why do most deep earthquakes occur at convergent boundaries?
- Deep earthquakes occur where one tectonic plate sinks beneath another. This occurs at convergent boundaries.
- The locations of volcanoes and earthquake epicenters are related to the locations of...?
- Plate Boundaries
- Volcanoes occur along ____, ____, and ____.
- Rift zones, subduction zones, and at hot spots.
- Most earthquakes occur at ____, ____, and ____.
- Convergent, divergent, and transform plate boundaries.

Journal Reflection

- We are going to relate this to real life.
- Read p. 352 in your book.
- Complete the “Write” questions at the bottom of the page.