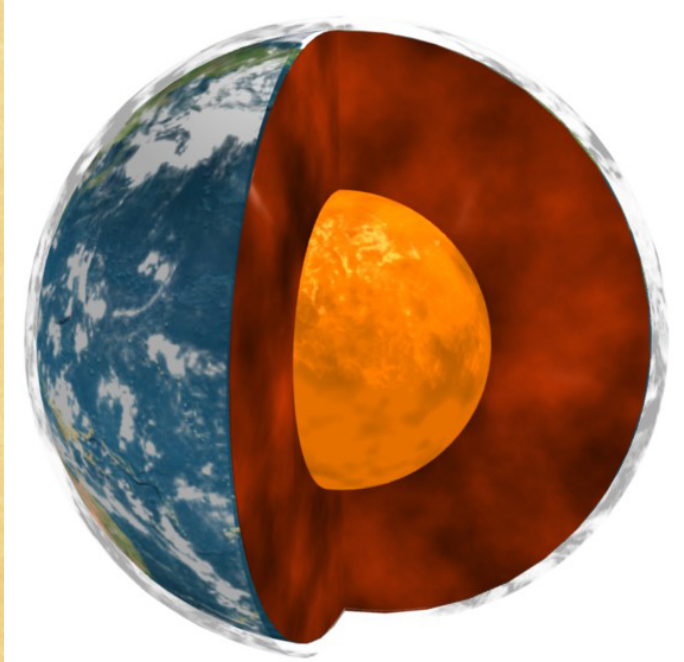


What is the Earth's Structure

Chapter 7 Lesson 1

ByDesign Science, Level 4
By Allyssa Sharpe

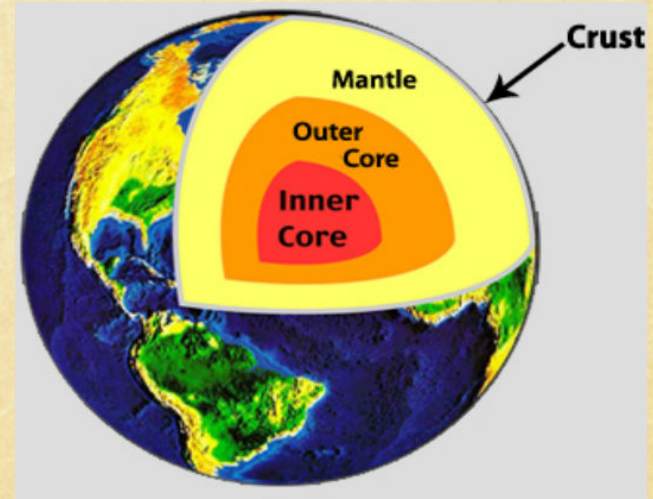
Earth's Layers



- ♦ The core is Earth's center layer.
- ♦ Most scientists believe it is made mostly of iron and smaller amounts of other metals such as nickel.
- ♦ There are two parts to Earth's core.

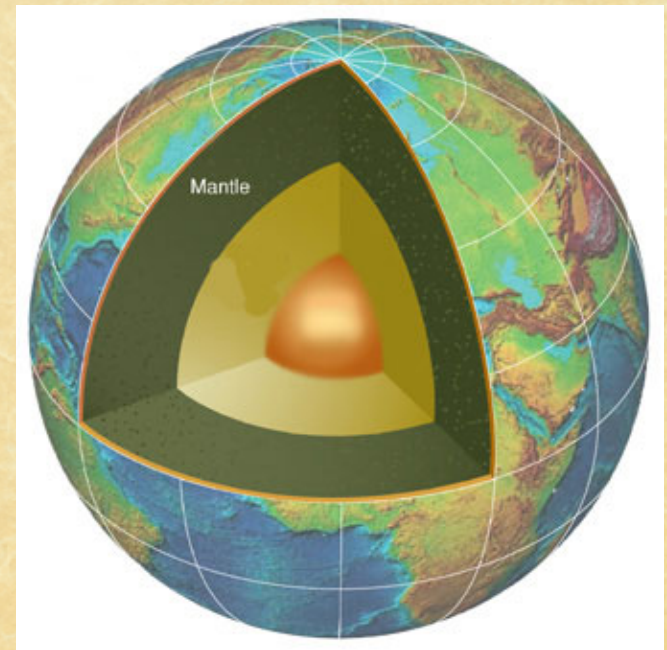
Earth's Layers

- ♦ The inner core is solid.
- ♦ It is the hottest layer of Earth.
- ♦ The temperature of the inner core is about 10,800F.
- ♦ In comparison, the temperature of the surface of the Sun is about 9,900F.
- ♦ Earth's outer core is the layer of hot liquid metal that surrounds the inner core.



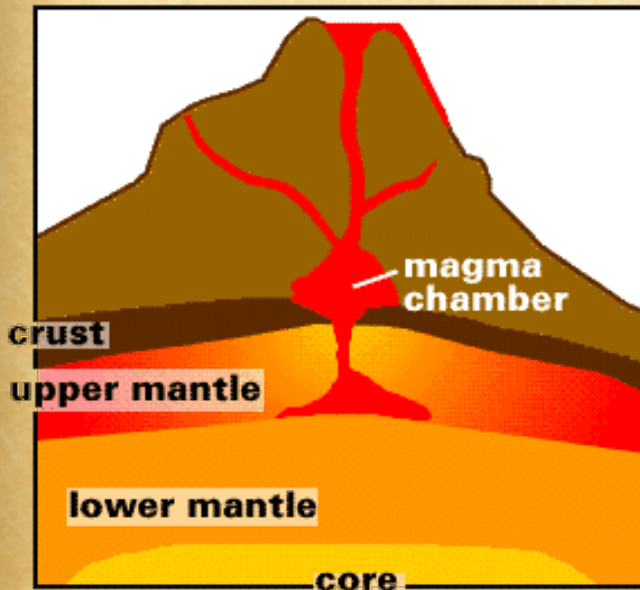
Earth's Layers

- ♦ The **mantle** is the middle layer of Earth. It lies between the core and the crust.
- ♦ It is the thickest of Earth's three layers.
- ♦ The mantle can be described as two layers – upper mantle and lower mantle.



Earth's Layers

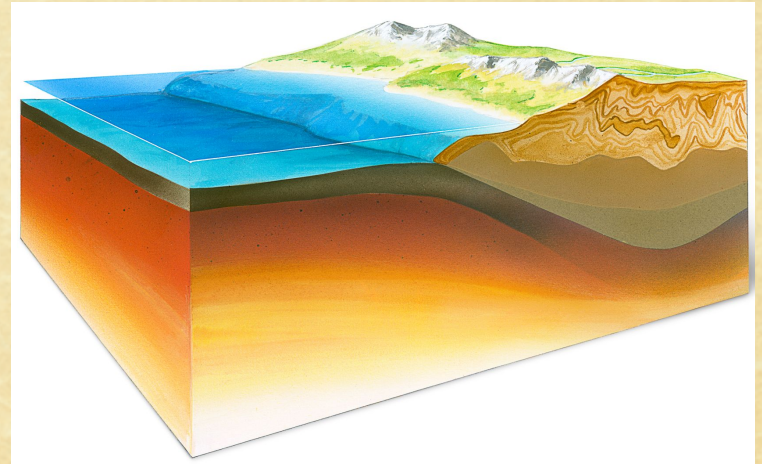
- ♦ The upper mantle is hot and under a great amount of pressure, so the rock can move and flow.
- ♦ Rock in the mantle is not liquid or melted, like magma.



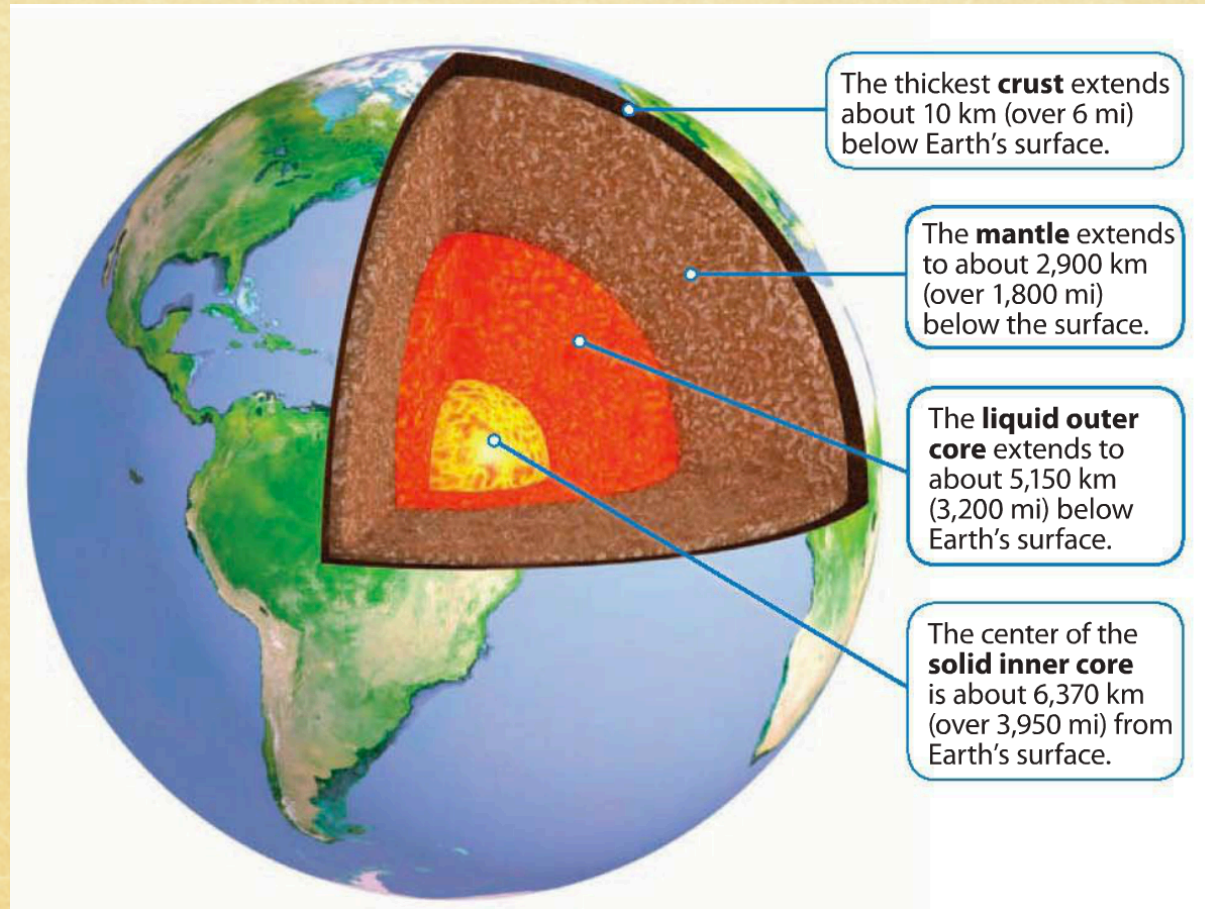
- ♦ But, it is so hot that it can flow and move like tar or molasses.
- ♦ Deeper, in the lower mantle, rock is ever hotter and under greater pressure.

Earth's Layers

- ♦ Earth's **crust** is its rocky outer layer.
- ♦ You live on Earth's crust.
- ♦ It is the thinnest layer, much like the shell of a hardboiled egg or an apple skin.
- ♦ The crust includes Earth's continents and the sea floor.
- ♦ The crust is flat and smooth in some places. Other parts of the crust have mountains, hills, and ridges.



Earth's Layers



Structure of the Earth



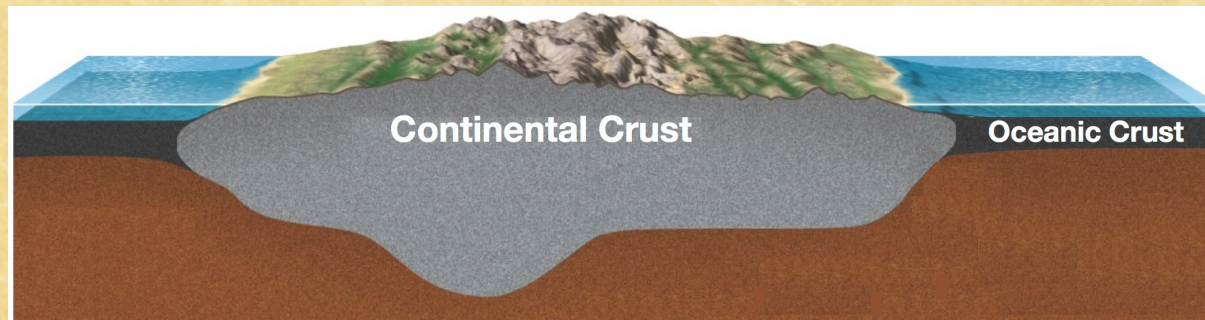
Earth's Layers



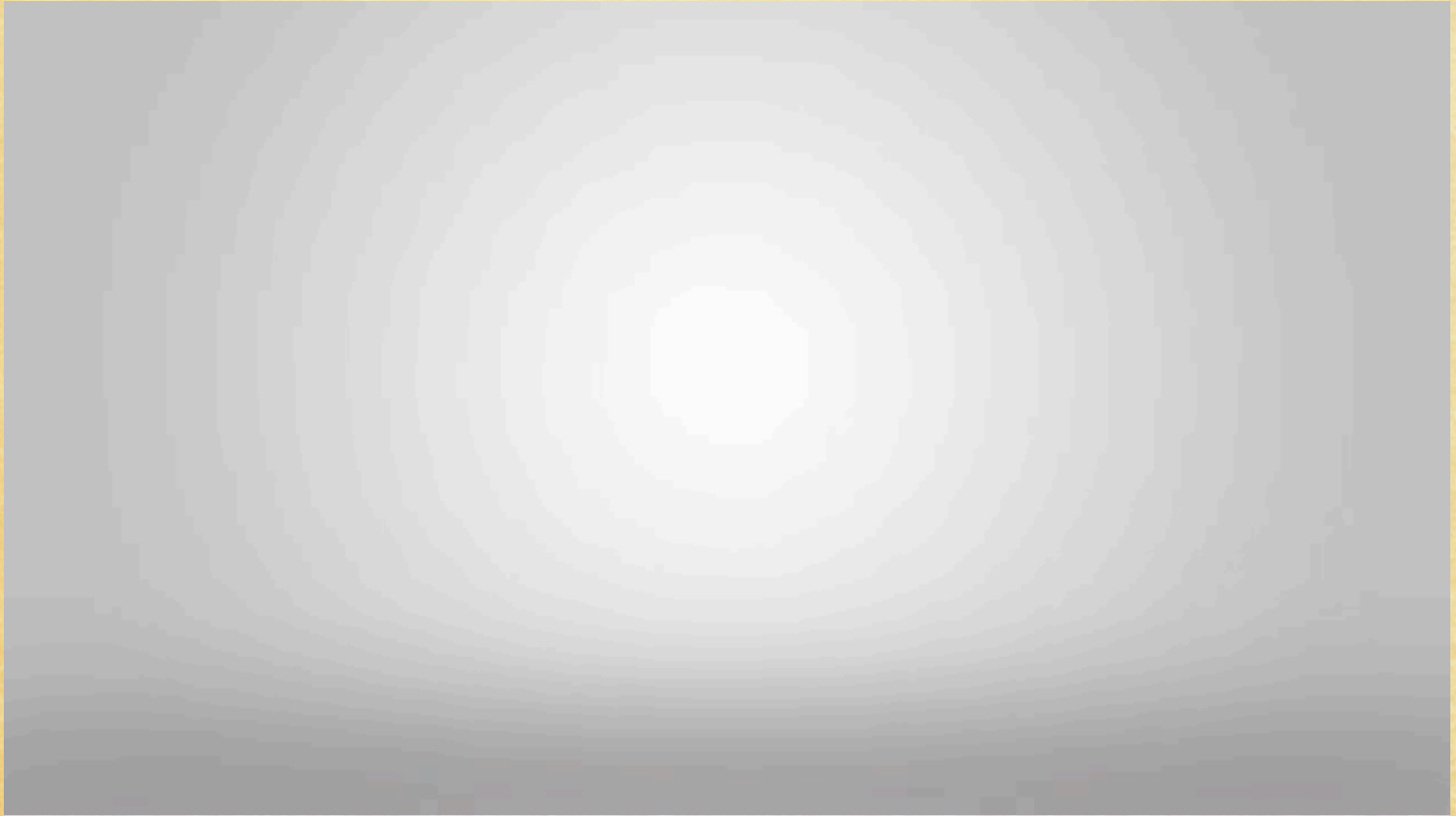
- ♦ Molten rock below Earth's surface is magma.
- ♦ Sometimes, magma rises through Earth's surface through cracks or weak spots.
- ♦ When this happens, the molten rock cools and becomes part of the crust.
- ♦ This happens where volcanoes erupt. It also happens at huge cracks in the sea floor.
- ♦ Molten rock flows out of the cracks and forms crust on either side of the crack.

Earth's Layers

- ♦ The rock that makes up the crust is much less dense than the rock that makes up the mantle.
- ♦ So, the crust “floats” on top of the mantle.
- ♦ Density is also the main reason Earth has layers.
- ♦ The metals that make up the core are much more dense than the rock that makes up the mantle.



Why Does the Earth Have Layers

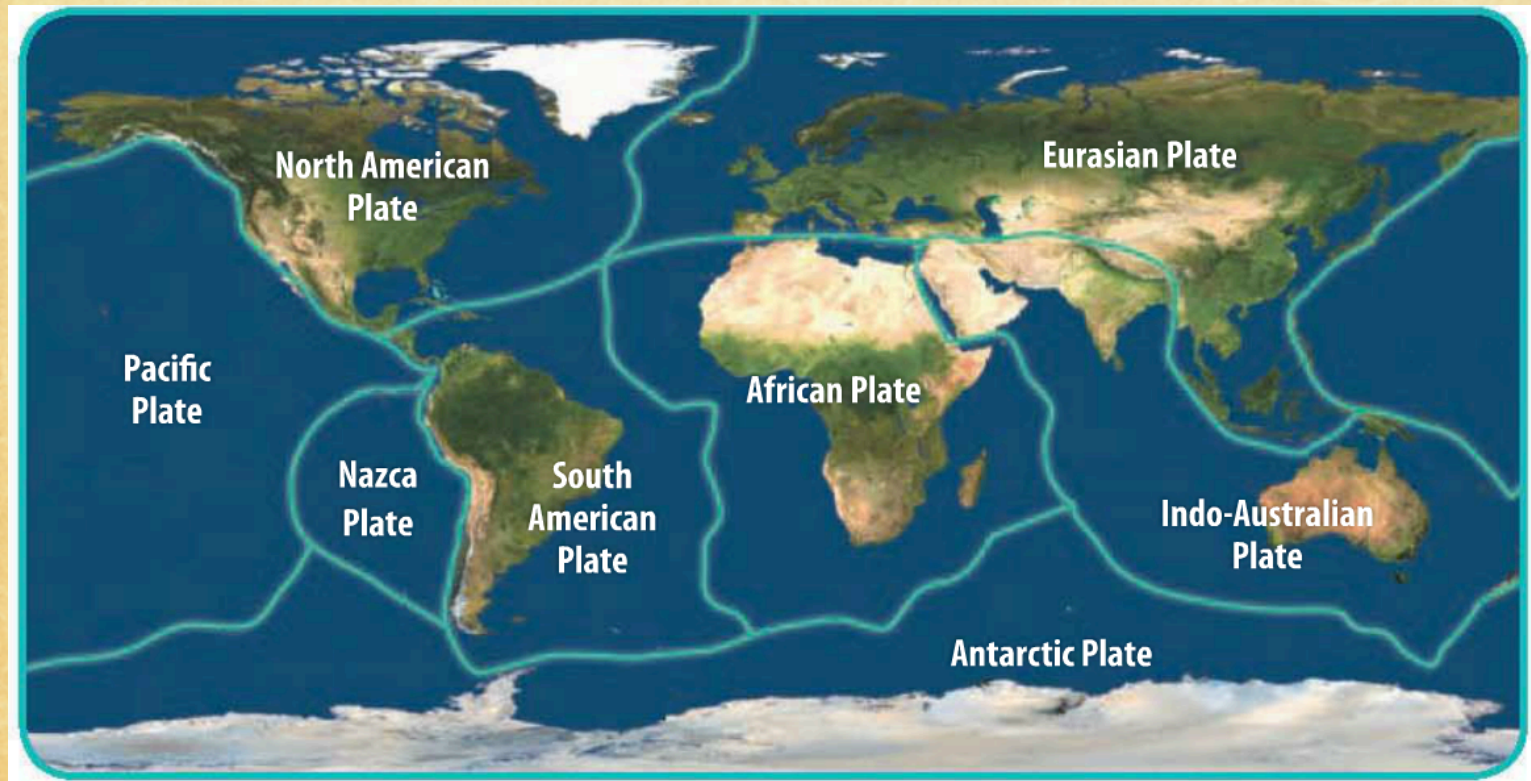


Earth's Cracked Crust

- ♦ Earth's crust is not a single, unbroken piece.
- ♦ Instead, Earth's crust is broken into several large slabs of rock called tectonic plates.
- ♦ Everything on the surface of Earth rests on a tectonic plate.
- ♦ There are about eight major tectonic plates on Earth and many smaller plates.

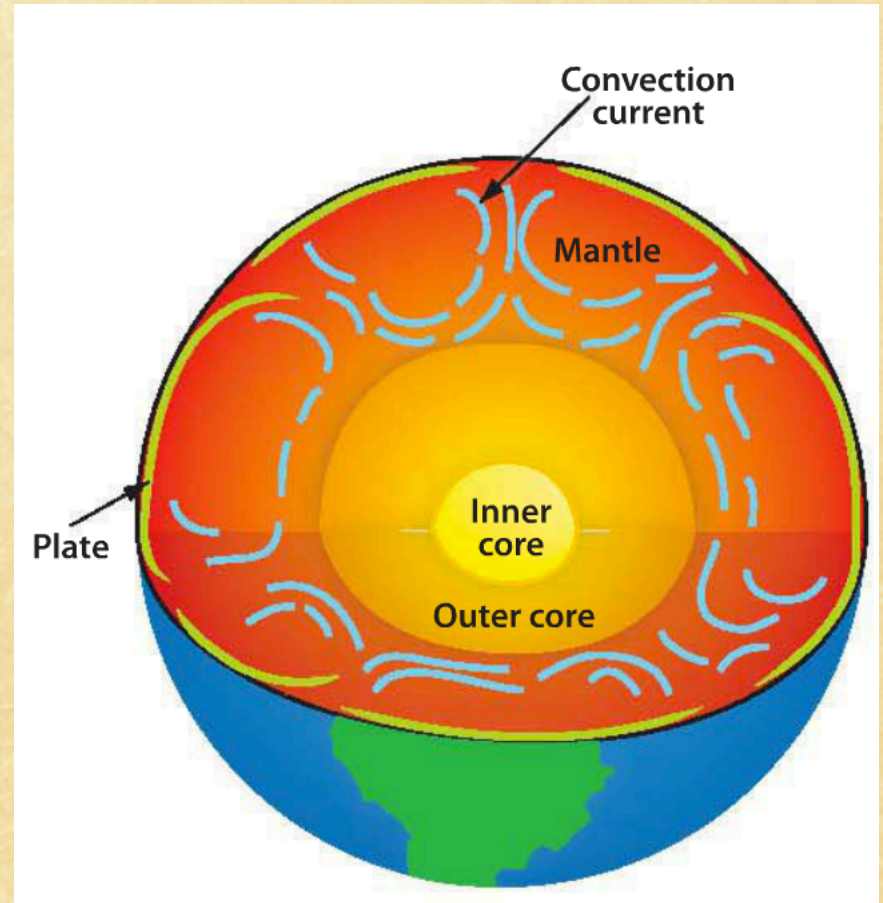


Earth's Cracked Crust

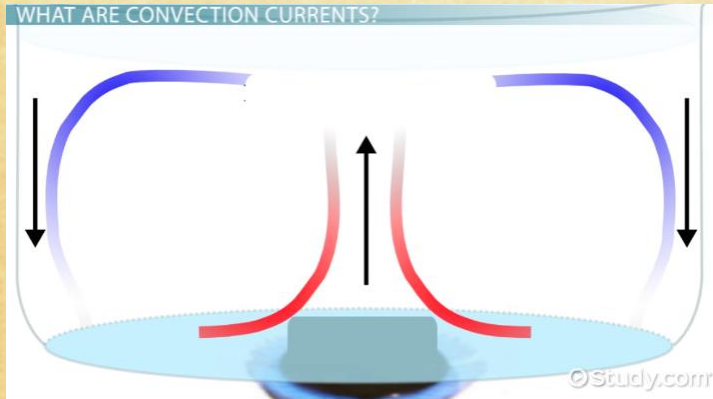


How Tectonic Plates Move

- ♦ Tectonic plates float on top of the mantle, like how a piece of wood floats on water.
- ♦ The mantle is super-hot melted rock. Temperature differences in the mantle cause convection currents.



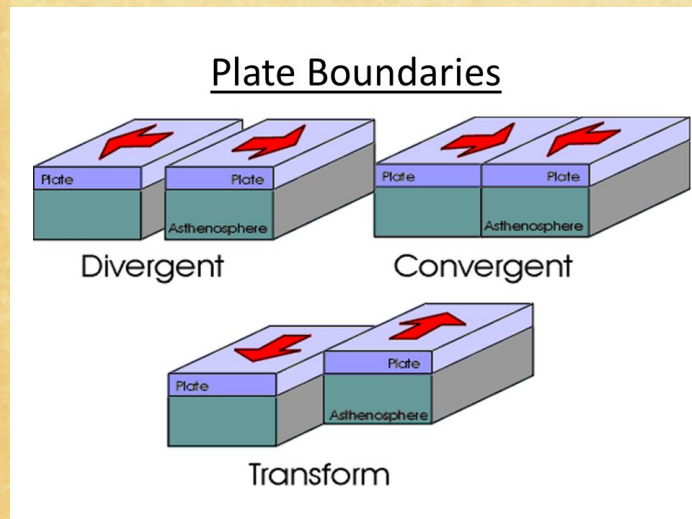
How Tectonic Plates Move



- ♦ Convection is the process that causes wind to blow. Warm air to rise and cools. Then, the cooler air sinks. As it heats up, it rises again, in an endless current.
- ♦ The same thing happens in the rock that makes up the mantle.
- ♦ In the mantle, hot, less dense rock rises, and cooler, more dense rock sinks.
- ♦ As it sinks into the lower mantle, it heats and rises. This creates convection currents in the mantle.

How Tectonic Plates Move

- ♦ The motion of the mantle pulls tectonic plates across Earth's surface.
- ♦ As the plates move, they push against each other, pull apart from each other, and slide past each other.



- ♦ These interactions are related to processes such as mountain building, earthquakes, and volcanic eruptions.

Plate Tectonics



Review

1. What are the layers of the earth, starting from the top and going inwards?
A. crust, mantle, outer core, inner core
2. Is the inner core a liquid or solid?
A. solid
3. Is the outer core a liquid or a solid?
A. liquid
4. What is the thickest layer of the Earth?
A. mantle
5. What is the thinnest layer of the Earth?
A. crust

Review

6. What is the main reason Earth has layers?
 - A. density
7. What are plate tectonic?
 - A. Earth's crust broken into several large slabs of rock
8. About how many major plate tectonics are identified today?
 - A. 8
9. When are many earthquakes and volcano eruptions most like to occur?
 - A. when plates move