

NAME _____

Going DEEP with PLATE TECTONICS

Study Guide and Practice

How do mountains form? Why do earthquakes happen? What is a volcano and why does it erupt? Throughout recorded human history, there were always questions like these trying to understand how or why these events happened. Questions such as these led to plenty of research from hundreds of scientists over the past century to find the answers. These answers were found! From the collected facts and evidence, there was a theory to explain it all... The *Theory of Plate Tectonics*!

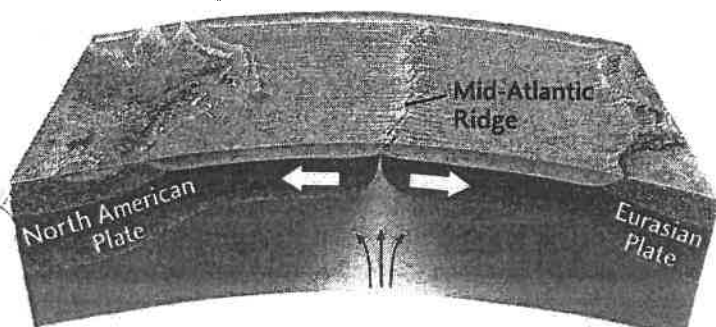
We live on a restless Earth, in which 7 major and 8 minor tectonic plates move about on top of the asthenosphere. Whether they are colliding, dividing, or sliding, these plates are always in motion. Where these plates meet, called 'plate boundaries', is where most of the earthquakes and volcanoes on Earth happen.

The Theory of Plate Tectonics underlines that the Earth forms new crust at the mid-ocean ridges. This crust begins to move outward to either side of the ridge. As it moves, it is forced below another plate where it is melted back into magma. Far into the geological future, this recycled crust emerges again at a mid-ocean ridge.

What causes the plates to move about? It's very simple really! It's called **CONVECTION CURRENTS**! Think of how boiling water in a pot moves... the hotter water rises up. Then, as the water moves to the pot's edge, it is forced back down to be heated back up again. Inside the Earth, instead of convecting water, it is convecting magma.

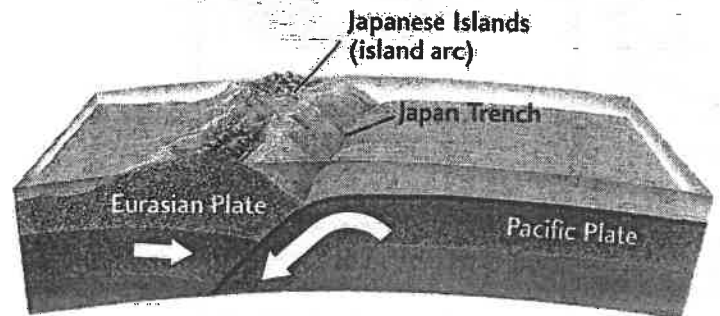
There are **THREE** types of plate boundaries: **DIVERGENT**, **CONVERGENT**, and **TRANSFORM**! Each of these give rise to new landforms and can cause many natural disasters.

Divergent Plate Boundaries are where plates are moving away from each other. This movement is found along mid-ocean ridges where new crust material is being formed.

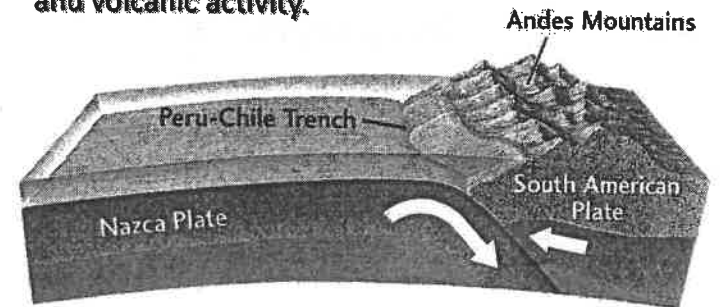


Convergent Plate Boundaries are where one plate subducts under crust that is less dense to be recycled back into the asthenosphere. There are three type of convergent plate boundaries:

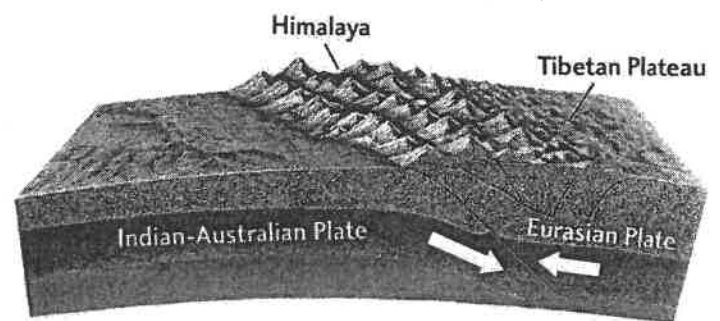
- **Ocean to Ocean:** when the crust of two oceanic plates meet, usually forming island arcs.



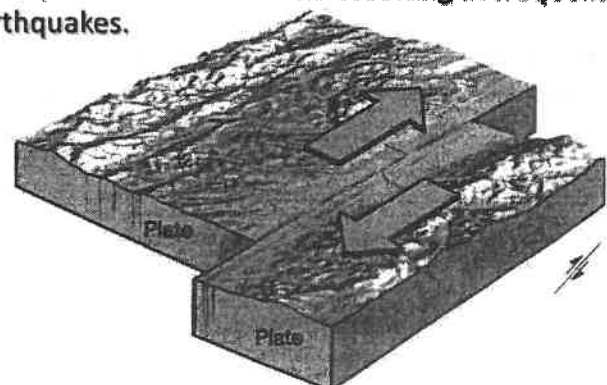
- **Ocean to Continental:** when ocean crust subducts under continental crust forming mountain chains and volcanic activity.



- **Continental to Continental:** when two continental plates meet and buckle up forming large mountains.



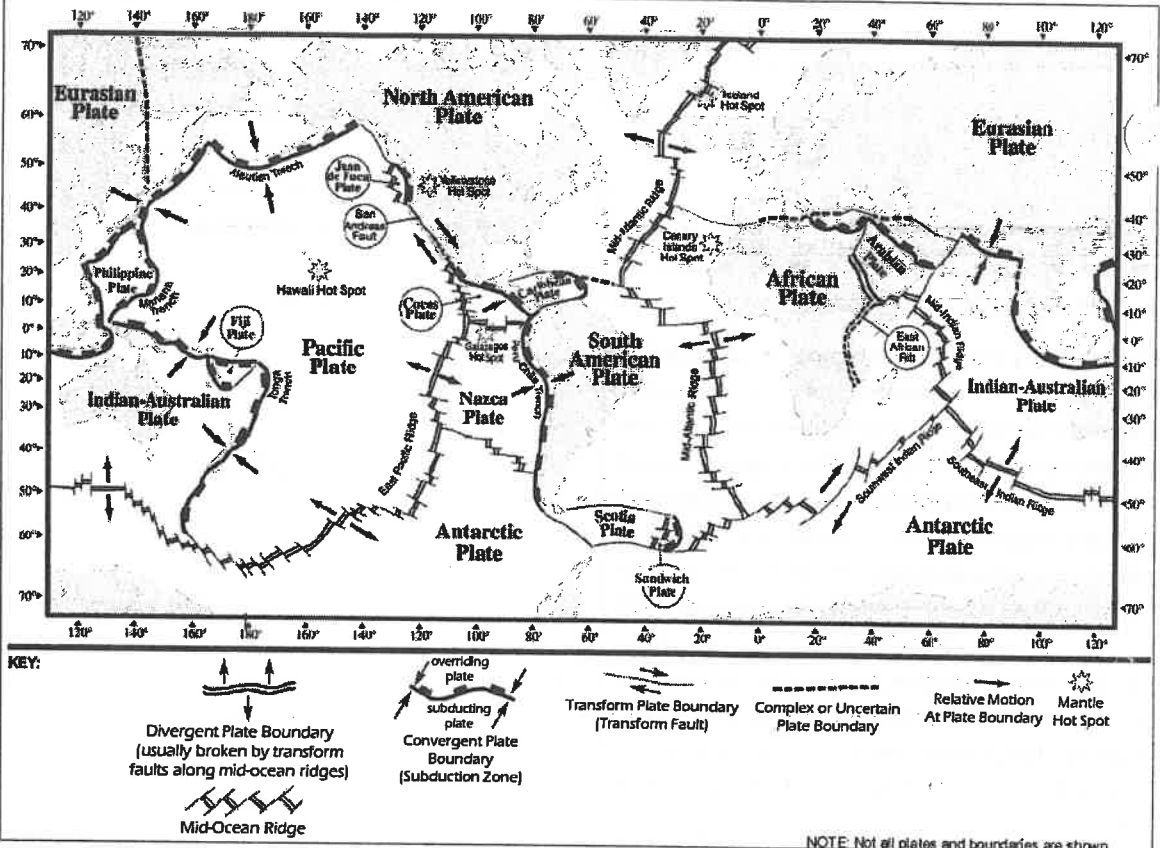
Transform Plate Boundaries are when plates move side by side with each other resulting in frequent earthquakes.





Directions:

- Using the map to the right, determine what type of plate boundary exists between each of the two plates and record in the table provided.
- Record the stress type that occurs at the plate boundaries. Use the choices below for stress type.



KEY:

- Divergent Plate Boundary (usually broken by transform faults along mid-ocean ridges)
- Convergent Plate Boundary (Subduction Zone)
- Transform Plate Boundary (Transform Fault)
- Complex or Uncertain Plate Boundary
- Relative Motion At Plate Boundary
- Mantle Hot Spot

NOTE: Not all plates and boundaries are shown

Plate Boundary	Boundary Type	Stress Type
Indian-Australian Plate and Eurasian Plate		
Antarctic Plate and Pacific Plate		
Caribbean Plate and South American Plate		
Pacific Plate and Juan de Fuca Plate		
North American Plate and Pacific Plate @ San Andreas Fault		
Nazca Plate and South American Plate		
Arabian Plate and Eurasian Plate		
Scotia Plate and Antarctic Plate		
North American Plate and Eurasian Plate		
Philippine Plate and Pacific Plate		

Questions:

- Where does the most earthquakes and volcanoes occur on the Earth's surface?
- Explain why 'recycling' is used to describe the process of the tectonic plates.
- How could the movement of tectonic plates create another supercontinent like Pangaea?
- The core of the Earth provides the heat that creates the convection currents of the mantle and drives the tectonic plates. Describe what would happen as the Earth's core cools down over billions of years?
- What are the different ways in which the tectonic plates interact with each other as they move around?