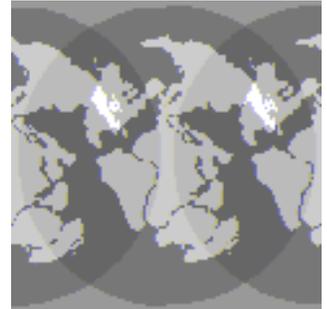


Understanding Pangea : Read the paragraphs, then answer the questions which follow.

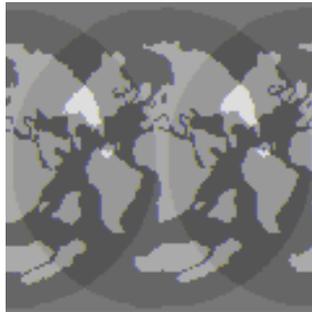
Scientists believe the earth's continents move through a process known as "plate tectonics". This basically says the continents are like plates that float and move around on the molten rock beneath.



About 225 million years ago, all the earth's continents were combined in one massive super-continent, known as Pangea. (To the left.)

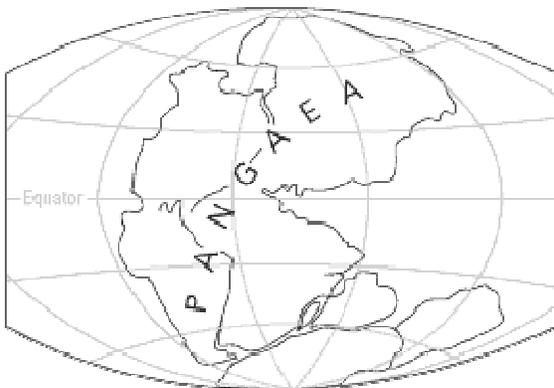


By 135 million years ago, Europe and North America had started to separate, and the Atlantic ocean was beginning to appear. Meanwhile, Gondwanaland had broken up: Australia and Antarctica had split off, and India had begun its long drift north. (To the right)

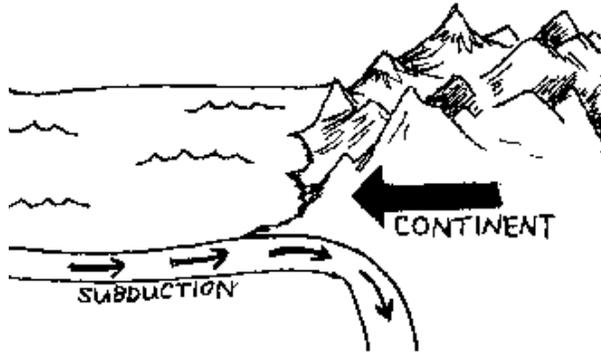


By 65 million years ago, when dinosaurs became extinct the Atlantic had opened still further, and India continued drifting north. After the dinosaurs became extinct, the continents have continued moving until the present today, eventually arriving in the positions that we are familiar with.

On the pictures below: Label the six continents and India.



Understanding Plate Tectonics I: Crustal plates can either be oceanic (ocean) or continental (land), sometimes they could be oceanic on one side and continental on their opposite side, too. Read the paragraphs below and answer the questions which follow.



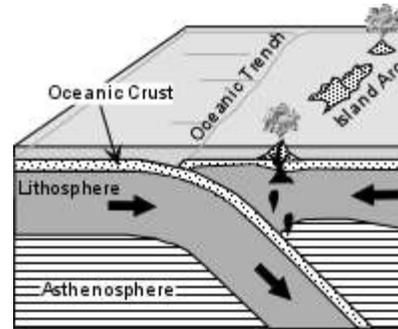
A very common crustal movement is when the edges of an ocean plate slides under (subducts under) a second type of crustal plate.

If the second plate is a continental type plate (land), then _____ form over the subduction area as in this picture.

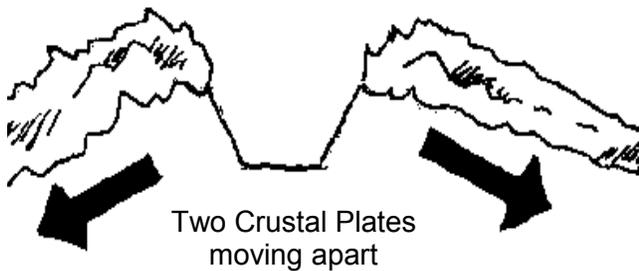
If an ocean plate subducts under a second plate; AND the second plate is ALSO an oceanic plate, then _____ form.

What does the term subduct mean? _____.

From the picture, what occurs at "trench"?



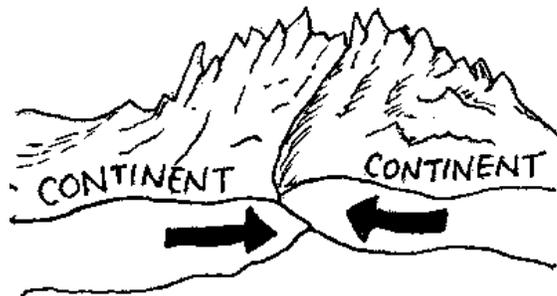
Ocean - Ocean Convergence



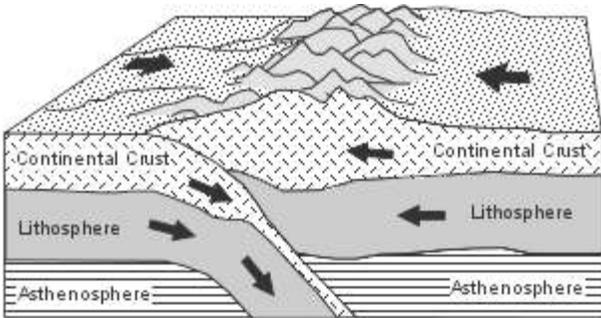
Sometimes two crustal plates move apart from each other. In the middle of "their separation" new crust is formed.

On land this could create a giant valley. However, if the crusts separate near water, and are below sea level, then a new _____ may form.

Look at the picture on the left. Here two _____ plates are colliding together. When this occurs, sometime one plate will subduct under the other; or more likely, the two plates will move straight up and form _____. Today, the Indian Plate is colliding into the _____ plate forming the _____ mountains.



Understanding Plate Tectonics II:

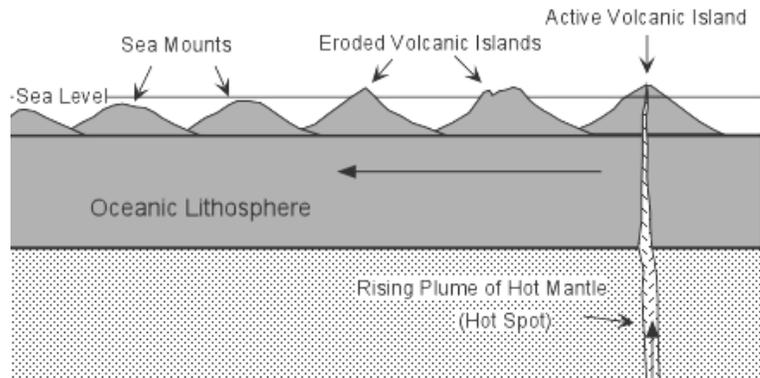


What type of tectonic activity is occurring at the left? _____

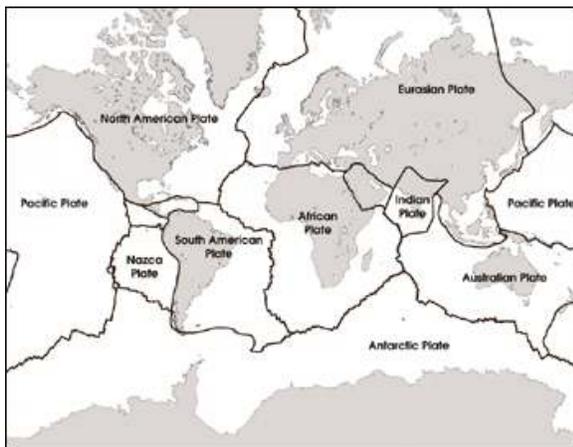
When one plate slides under another, what is that called? _____

What geographic phenomenon is being formed by this collision _____

Hot spots occur when there is a break or "hole" in one of the plates which then allows hot magma to push its way through to the surface. If this occurs in the middle of an oceanic plate, a chain of _____ may form. As the crustal plate continues to move, over millions of years, a chain of islands may develop. Which US state has formed over such a tectonic hot spot? _____.



Interestingly, hot spots can also affect continental plates. Yellowstone National Park is thought to be formed because it is over such a hot spot in the crust.



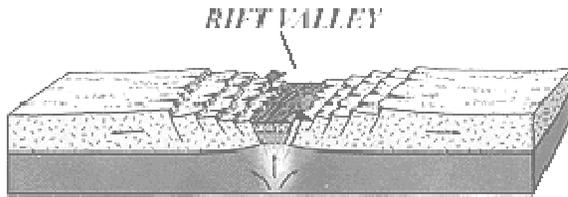
Examine the picture at the left. What is this a diagram of? _____

Put an H where you would expect to find the Hawaiian hot spot. What plate is it in the middle of? _____

Put a Y where you would expect to find the Yellowstone hot spot. What plate is it in the middle of? _____

Off the coast of Ecuador, in the center of the Nazca Plate there is another hot spot which forms the Galapagos Islands. Place an X on your map to show its location.

Understanding Plate Tectonics III:



Describe what type of tectonic movement is diagrammed in this picture.

If this type of crustal movement occurred in the middle of the ocean, then ocean itself would become _____ (wider or smaller). The area in center would probably have a lot of v_____ and e_____.



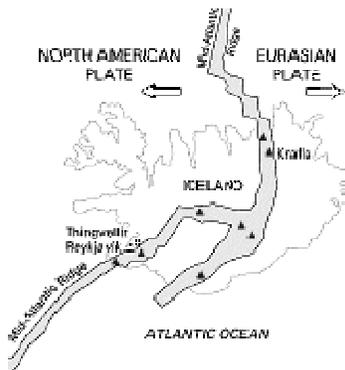
We know that such activity occurs at the Mid-Atlantic ridge which is at the center of the _____ Ocean.

The ocean is getting larger, because it spreading at the _____ creating new ocean floor. This type of tectonic activity is called sea-floor spreading.

Notice the island which is circled in the picture. On what tectonic boundary does it lie? _____

This island is Iceland. What do think is happening to the island based upon the tectonic activity of the Mid-Atlantic Ridge?

If you went to Iceland, what tectonic events might you expect to find there?

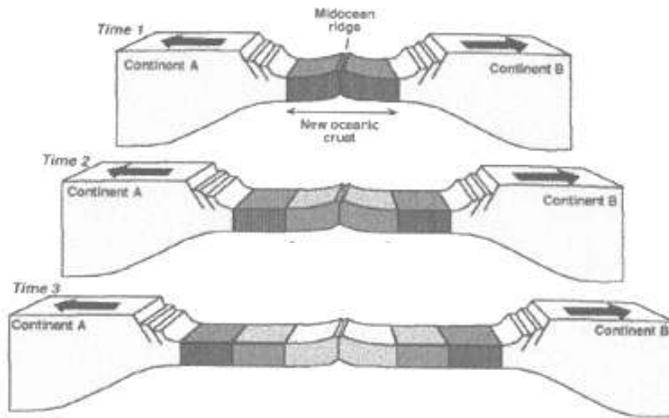


Here is a close up picture of Iceland.

What do you thin the black triangles represent on this diagram? _____

If you could visit Iceland in another 500,000 years, what would you expect the landform to look like there?

Understanding Plate Tectonics IV:



Examine the picture on the left.
What tectonic event is occurring?

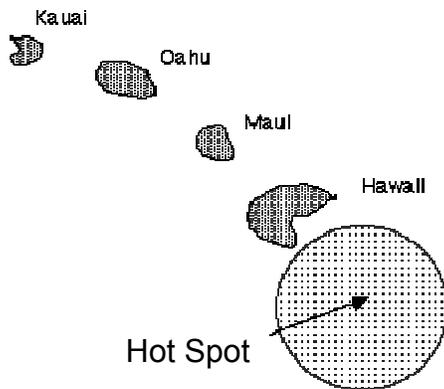
In the 2nd picture there are two sections of grey oceanic crust.
Which section of crust is newer?

Why? _____

In the 3rd picture there are three sections of oceanic crust. Which section is the newest? _____

In picture three above, if you include the continental crust on both sides, which crust would be the oldest? (*Continental, Dark Grey, Medium Grey, Light Grey*) Why?

HOT SPOTS

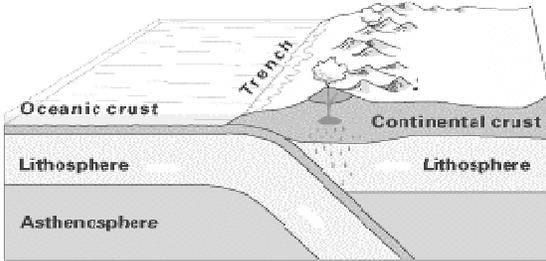


The diagram at the left depicts the Hawaiian hot spot. We know that crustal plates are always moving. And we know that hot spots do not move. Draw an arrow on the diagram to indicate the direction in which the Pacific Plate must be moving.

What do you think exists at the center of each of the Hawaiian Islands? _____

Hawaii is the youngest (and largest) island of all of the Hawaiian Islands. If you came back in 500,000 years, what would you expect to find in the red circled area? _____

Understanding Plate Tectonics V:



What is occurring at the trench in the diagram to the left? _____

The movement of the two crusts forms what type of landforms? _____

As the oceanic lithosphere slides under the continental lithosphere, it begins to _____ and form more magma under the surface of the continental crust. This melting and movement usually causes _____ and _____ to occur.



The picture to the left is the San Andreas Fault.

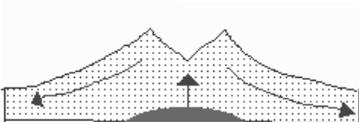
The Pacific Plate is moving _____.

The North American Plate is moving _____.

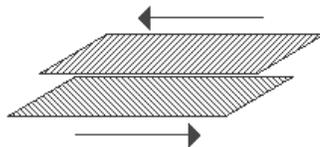
Using your knowledge of California's tectonic activity, what do you think occurs when two crustal plates rub against each other _____

If you came back in 500,000 years, what might you expect to find in this area?

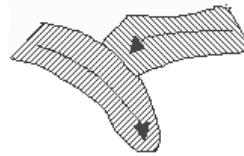
In the diagrams below: Each of the 4 diagrams below depicts the movement of two different crustal plates. Describe the tectonic activity occurring for each situation.



2 Continental Plates



Either Crustal Types



Oceanic + Continental

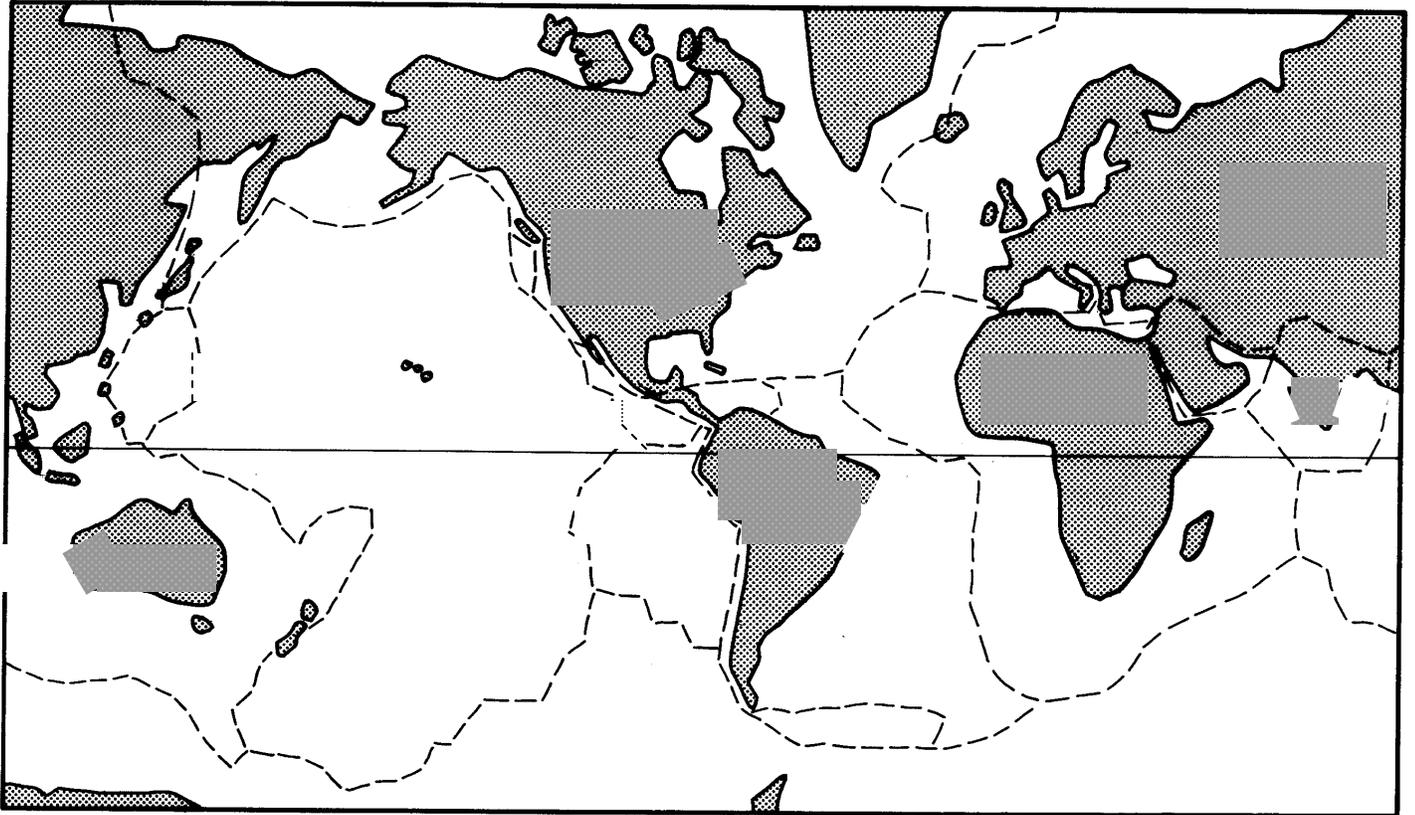


Continental + Continental

2 Oceanic Plates

Oceanic + Oceanic

Tectonic Plates



On the picture below label (or number), then color the following plates:

- North American Plate
- South American Plate
- Caribbean Plate
- Antarctic Plate
- Cocos Plate
- Philippine Plate
- Indian Plate
- Eurasian Plate
- African Plate
- Pacific Plate
- Nazca Plate
- Juan de Fuca Plate

