Dynamic Earth Mini – Unit Test Review Sheet

ESSENTIAL QUESTION: How and why has our earth's surface changed over time

1. Differentiate between P and S waves

P Waves	S Waves
Primary Waves	Secondary Waves
Travel Faster	Travel Slower
Travel Through Solids, Liquids, and Gases	Travels Only Through Solids

2. Explain why the differences between P and S waves are relevant to our understanding of Earth's layers.

3. Identify the layers of Earth's interior and explain how density separate Earth's interior layers

The layers of Earth's interior include the crust, lithosphere, mantle, outer core and inner core. Earth's interior is separated into layers through density. Layers with the lowest density can be found towards the top, whereas layers with the highest density can be found towards the bottom. Due to the density, the thinnest layer of the Earth, the crust, can be found as the first layer, then the lithosphere. The largest layer which takes up the most volume of the Earth is the mantle. The fourth densest layer is the outer core. The final layer is the inner core, which is the densest layer compared to all of the others.

4. Describe the evidence supporting Alfred Wegener's continental drift theory. (Student model of a letter from Alfred Wegener)

After careful research and investigation, I have am introducing to you conclusive theory about the continents of our Earth. I believe that they were once connected in a large one land mass that I call "Pangaea." I chose this name for the land mass because in Greek it means, "all land." In this letter I will describe two major pieces of evidence that support my theory. I hope you will read it and find my theory to be conclusive.

Have you ever looked at the "World Today Map" and observed the east coast of South America and the west coast of Africa? I have, and I thought to myself, " Why are those continents shaped like that? Those continents look like they fit together!" Perhaps you think this was a coincidence, but I took this thought a step further. I cut out the continents of our Earth to create a model of Pangaea, which shows that all of the continents fit together like one large puzzle. This was the first piece of evidence I developed for my theory of Pangaea.

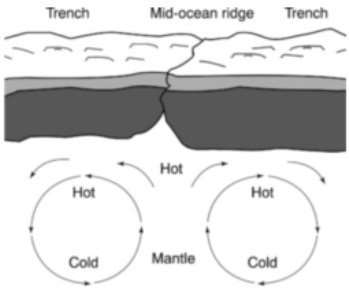
The second piece of evidence came from my research of investigating fossils. I became interested in the fossil of the freshwater reptile known as the Mesosaurus. The Mesosaurus lived 240 million years ago and had physical features such as limbs to swim and also walk on land. The fossils of this animal were found on the coast of South America, Africa, and Australia. If the Mesosaurus was a freshwater reptile, how is it possible that their fossils were found on various continents? They were not able to swim across the saltwater ocean. The only explanation for this is that those continents were actually once joined together.

As my evidence clearly suggests, all the continents were once one piece of land called Pangaea. Please support me in my research. Together, we can build more evidence for this theory and perhaps make predictions about the future of our continents.

5. Describe the theory of plate tectonics

In the theory of plate tectonics scientists use the pattern of convection currents in the mantle to explain the resulting tectonic plate movement in the crust. This theory supports Wegener's theory that continents were once originally all one land mass (Pangaea). Over time, the plates moved into their current positions due to the convection current movement in the mantle. The movement of plates at plate boundaries (where two plates meet) creates geologic occurrences (earthquakes) and formations (mountains/earthquakes).

6. Describe how convection currents cause plate movement



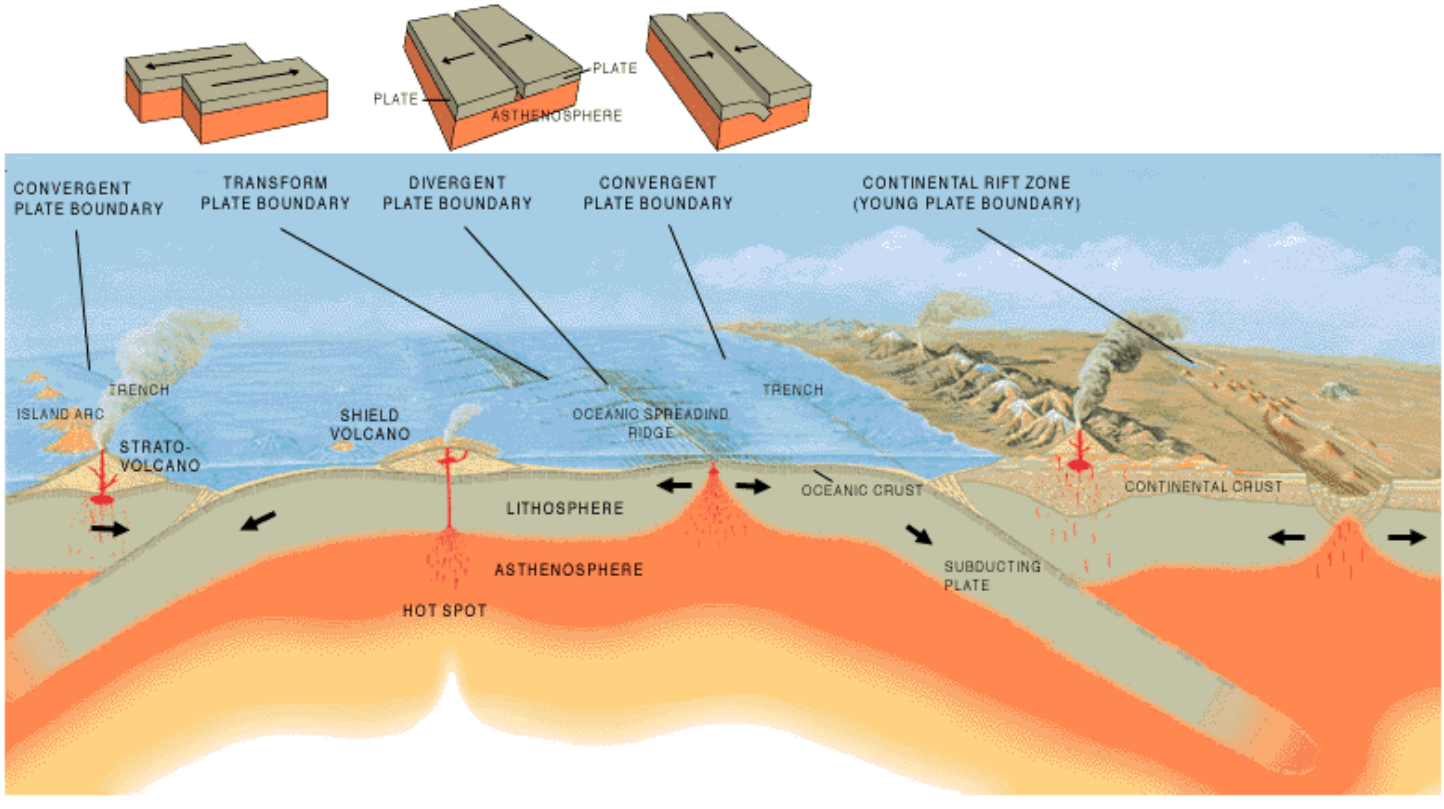
Convection currents cause plate movement. Within the mantle, rock material move in a cyclical motion. The hot rock material floats to the top of the mantle and cool rock material sinks to the bottom of the mantle. This cycle continues to repeat itself.

When the convection currents in the mantle turn, the plates above can move either towards each other and clash to create a mountain or volcano. The convection currents could also cause the continents to travel in separate directions and create a larger ocean.

Cause- Heat from the core → **Effect- Convection currents in the mantle** → **Effect- Tectonic plate movement in the curst**

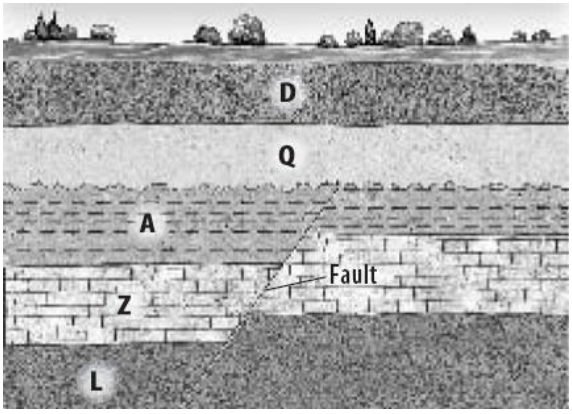
7. Explain how plates move at various types of boundaries.

There are three various types of plate boundaries. One boundary is transform boundaries. When the plates rub against each other these boundaries are called transform boundaries. The second boundary is convergent boundaries. When the plates move towards each other these boundaries are called convergent boundaries. At convergent boundaries, one plate may be sub-ducted under the other plate. The final plate boundary is divergent boundaries. When the plates move away from each other these boundaries are called divergent boundaries.



8. Describe how sequencing of rock layers allows scientists to relatively date rock layers/fossils. (The Principle of Superposition)

Fossils are the remains of ancient plants and animals.



Awesome Animation Links
Convection Currents: http://education.sdsc.edu/optiputer/flash/convection.htm
Ring Of Fire: http://vimeo.com/20966740
The Three Types Of Plate Boundaries: http://vimeo.com/69566320

Vocabulary
Crust – hard/solid and rigid, it's the Earth's outermost and thinnest layer, only a few miles (5 km) thick under the oceans and averaging 20 miles (30 km) thick under the continents.

Lithosphere – Made up of the crust and a tiny bit of the upper mantle, this layer is divided into several constantly (very slowly) moving plates of solid rock that hold the continents and oceans (plate tectonics). Also, the lithosphere is a solid.

Mantle – subdivided into two regions, upper and lower, this dense layer made of hot, semisolid rock is located directly below the crust, but is above the outer core and is about 1,800 miles (2,900 km) thick. The mantle occupies 80% of the Earth's volume, it is the thickest layer, and is made of semi – solid rock.

Outer Core – the only liquid layer of the earth, a sea of mostly iron and nickel. It is roughly 1,800 to 3,200 miles (2,890 to 5,150 km) below the surface and about 1,400 miles (2,300 km thick. The outer core is above the inner core, but below the inner core.

Inner Core – An extremely hot, solid sphere of mostly iron and nickel at the center of the earth. It is 3,200 to 3,960 miles (5,150 to 6,378 km) below the surface and about 750 miles (1,200 km) in diameter. It is the center sphere of the Earth and below the outer core. It is also thinner than the outer core and the mantle, but thicker than the crust.

Density – the relationship between mass and volume. In the Earth's inner layers the layer with the

lowest density can be found at the top, but the layer with the higher density can be found at the bottom.

Convection – the transfer of heat by the circulation or movement of the heated parts of a liquid or gas.

Earthquake – movement of the ground that occurs when rocks inside Earth pass their elastic limit, break suddenly, and experience elastic rebound *rubber band and then it breaks*

Volcano – cone shaped hill or mountain formed when hot magma, solids, and gas erupt onto Earth's surface through a vent

Mountain – the result of when two plates collide and the landform of a mountain is made

Tectonic Plate – a large section of Earth's oceanic or continental crust and rigid upper mantle that moves around the asthenosphere

Pangaea – large, ancient landmass that was composed of all the continents joined together; means "all land"

Fault Boundary – plate boundary = fault boundary *just another term*

Fossil – remains, imprints, or traces of prehistoric organisms

Relative Age – something of its age in comparison to the ages of other things

Ring Of Fire – a plate on the Pacific Ocean that grinds against the other plates around it resulting in several volcanoes and earthquakes where the plates are grinding against each other

Principal Of Superposition – states that in undisturbed rock layers the oldest rock are on the bottom and the rocks become progressively younger toward the top

AWESOME BRAINPOPS
EARTH
EARTH'S STRUCTURE
EARTHQUAKES
FLOODS
FOSSILS
PLATE TECTONICS
VOLCANOES
TSUNAMI

OTHER AWESOME BRAINPOP VIDEOS TO WATCH INCLUDE PANDAS AND PENGUINS

LINKS TO THESE GLENCOE QUIZZES
http://glencoe.mcgraw-hill.com/sites/0078778646/student_view0/unit1/chapter5/section1/section_quizzes_-_english.html

http://glencoe.mcgraw-hill.com/sites/0078778646/student_view0/unit1/chapter5/section2/section_quizzes_-_english.html

http://glencoe.mcgraw-hill.com/sites/0078778646/student_view0/unit1/chapter6/section1/section_quizzes_-_english.html

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http://glencoe.mcgraw-hill.com/sites/0078778646/student_view0/unit1/chapter7/section3/section_quizzes_-_english.html

NOVA JAPAN'S KILLER QUAKE LINK
http://www.pbs.org/wgbh/nova/earth/japan-killer-quake.html

NOVA DOOMSDAY VOLCANOES
http://www.pbs.org/wgbh/nova/earth/doomsday-volcanoes.html

COOL INTERAVTICE LINKS FOR THIS UNIT
http://www.learner.org/interactives/dynamicearth/structure.html

https://ees.as.uky.edu/sites/default/files/elearning/module06swf.swf

LINKS TO EXIT TICKETS, LABS AND IN-CLASS PROJECTS/WORK, AND POWERPOINTS ON THE SCIENCE WEBSITE
https://docs.google.com/document/d/19Zuj0koQ9AfbxzE0DWL0fRsrHgLG6KwMFLL7Zdl3Bno/edit?pli=1

https://docs.google.com/document/d/1Yzm4aRLo2evCAGGnqSztjmepMVODmvNZU2iELoj6dbk/edit?pli=1

https://docs.google.com/document/d/14mffB1MoAADDkrPWSTwiHqj56VGF05Y2DsFj5fQ79uw/edit?pli=1

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https://docs.google.com/presentation/d/1vEMTJj9DK_FJcDYbGs4nrsR1hOeGDHGNhdxQBZjLS6Y/edit?pli=1#slide=id.g2a674d398_0105

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