**![C:\Documents and Settings\mhipps\Local Settings\Temporary Internet Files\Content.IE5\5WTGXJ0E\MC900432540[1].png]()![C:\Documents and Settings\mhipps\Local Settings\Temporary Internet Files\Content.IE5\CYGCAZKS\MC900434816[1].png]()![C:\Documents and Settings\mhipps\Local Settings\Temporary Internet Files\Content.IE5\TW4Q1XJX\MC900432541[1].png]()**

![C:\Documents and Settings\mhipps\Local Settings\Temporary Internet Files\Content.IE5\WTYUZ7J5\MC900014755[1].wmf]()Inside the earth & HEAT Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Directions:**

*Your mission is to complete this learning journey. Your goal is to increase your understanding of everything heat and plate tectonics. If you feel that your knowledge is sufficient to perfume well on the test, look to broaden your knowledge and improve your understanding. Check off the links as you journey through the Earth!*

Section 1**![C:\Documents and Settings\mhipps\Local Settings\Temporary Internet Files\Content.IE5\BIMZZWRJ\MC900237283[1].wmf]()**: Review of heat Transfer

**Step 1 – Conduction, Radiation, Convection**

*Perform the following in any order. Check off the activity after you have completed it.*

\_\_\_ I watched the Bill Nye video on heat <http://www.youtube.com/watch?v=f1eAOygDP5s>

![C:\Documents and Settings\mhipps\Local Settings\Temporary Internet Files\Content.IE5\CYGCAZKS\MC900084348[1].wmf]()\_\_\_ Conduction Radiation Convection (Wisconsin Online) <https://www.wisc-online.com/learn/natural-science/earth-science/sce304/heat-transfer--conduction--convection--radiation>

***Answer the following question.***

What happens to the molecules of matter when heat is added? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Step 2– Temperature***Perform the following steps in order. Check off each activity as you complete it.*

BRAIN POP: Login Username and Password: apexmid

\_\_\_ I watched the Brain Pop on temperature.

\_\_\_ I completed my quiz on temperature. I then checked my score. Score \_\_\_\_ of 10.

**STEP 3 - Heat**

\_\_\_ I watched the Brain Pop on heat.

\_\_\_ I completed my quiz on heat. I then checked my score. Score \_\_\_\_ of 10.

\_\_\_ I completed the 3 puzzles on heat transfer. <http://www.webquest.hawaii.edu/kahihi/puzzles/energytransfer/energy3.php>

**STEP 4 – Test Your Knowledge**

\_\_\_ I completed the online quiz. <http://www.cstephenmurray.com/onlinequizes/physics/thermodynamics/typesoftransfer.htm>
\_\_\_ My score was \_\_\_\_ of 21



Section 2: the Earth

STEP: 1 – Earthquakes

BRAIN POP: Login Username and Password: apexmid

\_\_\_ I watched the Brain Pop on Earthquakes

\_\_\_ I completed my quiz on earthquakes. I then checked my score. Score \_\_\_\_ of 10.

\_\_\_ Watch this video: <https://www.youtube.com/watch?v=VSgB1IWr6O4>

|  |  |
| --- | --- |
| **Word** | **Definition** |
| Earthquake |  |
| Fault |  |
| Epicenter |  |
| Focus |  |
| Aftershock |  |

**STEP: 2 – Inside Our Earth**

*Click on the following links to find out how we know what the earth’s interior is made of. Then fill out the chart.*

\_\_\_ <https://www.ck12.org/earth-science/Seismic-Waves/lesson/Seismic-Waves-HS-ES/?referrer=concept_details>

\_\_\_ <http://www.bbc.co.uk/schools/gcsebitesize/science/21c/earth_universe/seismic_wavesact.shtml>

|  |  |  |
| --- | --- | --- |
| Type of Seismic Wave | Fastest wave | Materials each wave can travel through |
|  |  |  |
|  |  |  |

L-Waves (or surface waves) are a combination of P-Waves and S-Waves. Why do you think they cause the most damage?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

*Click on the following links and answer the questions that follow.*

\_\_\_ <http://aspire.cosmic-ray.org/Labs/SeismicWaves/seismic.swf>

\_\_\_ <https://www.classzone.com/books/earth_science/terc/content/investigations/es0402/es0402page01.cfm>

\_\_\_ <https://www.youtube.com/watch?v=p0dWF_3PYh4>

­­­\_\_\_\_ <http://ds.iris.edu/seismon/swaves/> (Click on play)

Which waves enter the mantle but not the outer core? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Which waves are able to go through all of our earth’s layers? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Are there any waves that are not changed as they move through the earth? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

***How do we know what the inside of our earth looks like? (You must use the term seismic wave)***

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**STEP: 3 – Earth Layers**

*Use the following link to find information on the Earth’s layers.* ***Label*** *and* ***color*** *the Earth diagram below.*

\_\_\_ <http://www.learner.org/interactives/dynamicearth/structure.html>



 **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

 **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

 **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

 **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

*List and briefly describe each layer from inside out. Make sure you list what each main layer is made of. Use the same link you used above.*

|  |  |
| --- | --- |
| **Layer** | **Brief description** |
|  |  |
|  |  |
|  |  |
|  |  |

***As a class we will complete: Layers of the Earth foldable.***

Define the following after the foldable is complete.

Lithosphere: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Asthenosphere: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Section 3:

How do we know that our earth is broken into plates?

**STEP: 1- Tectonic Plate Boundaries**

***Click on the link below. Follow directions exactly!!!!***

<http://d3tt741pwxqwm0.cloudfront.net/WGBH/conv16/conv16-int-tectonic/index.html>

\_\_\_Click on volcanoes. Do you notice any kind of pattern? Explain\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

\_\_\_ Click off volcanoes. Click on earthquakes. Do you notice a pattern? Explain\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

\_\_\_ Click on both earthquakes and volcanoes. What can you say about the locations of earthquakes and volcanoes?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_ Click on plate boundaries. What is the connection between the location of earthquakes and volcanoes and plate boundaries? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Summarize**: How do we know the location of plate boundaries? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Define: Plate boundary \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**STEP: 2- Broken Plates**

***See your teacher for “Broken Plates”.*** Use your textbook (pgs. R66, R67, and 95B) to complete the puzzle and label the plates.

* Step 1: Color as if the oceans are drained (ocean crust brown).
* Step 2: Color the continental crust green.
* Step 3: Cut out pieces and glue them correctly into your notebook.
* Step 4: Label the plates using the word bank and the textbook as a reference.
* Step 5: Using the text book use a red marker to add missing plates.

Why are some of the plates not identified on the handout? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Section 4: Convection in the mantle

*Use the links below to take you to a visualization of convection in the mantle. Use this to help you explain how convection causes our plate movements.*

<http://earthguide.ucsd.edu/eoc/teachers/t_tectonics/p_convection2.html>

<http://www.sciencebook.dkonline.com/11.html>

<http://education-portal.com/academy/lesson/causes-of-tectonic-plate-movement.html#lesson>Quiz Score: \_\_\_\_\_/5

[**http://education.sdsc.edu/optiputer/flash/convection.htm**](http://education.sdsc.edu/optiputer/flash/convection.htm)

***You must use the terms density, mantle, core, heat, magma, convection current.***

Step 1: Start with **magma** in the \_\_\_\_\_\_\_\_\_\_\_\_\_\_ that is near the outer \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

#2: **Magma** in the **mantle**, heats up, becomes less \_\_\_\_\_\_\_\_\_\_\_\_\_.

#3: This \_\_\_\_\_\_\_\_\_\_\_rises to the crust pushing the cooler more \_\_\_\_\_\_\_\_\_\_\_\_**magma** aside.

#4: This \_\_\_\_\_\_\_\_\_\_\_ now begins to cool near the Earth’s surface.

#5: As it cools the **magma** becomes more \_\_\_\_\_\_\_\_\_\_\_\_\_\_.

#6: This denser **magma** sinks back toward the \_\_\_\_\_\_\_\_\_\_\_\_\_.

#7: As this \_\_\_\_\_\_\_\_\_\_\_\_ gets closer to the core it gets \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

#8: Now hotter, this \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is less \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_and begins to rise again!

#9: This circular moving **magma** creates a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

#10: As the **magma** moves in a giant circle it drags the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Section 5:

How do we know that our continents were once connected and have moved apart?

**Step: 1- Wegener’s Puzzling Evidence**

***As a class we will complete: “Wegener’s Puzzling Evidence”.***

After yours is completed please answer the following question:

1. Do you think Wegener’s evidence proved our plates moved? \_\_\_\_\_\_\_\_\_\_\_ Why do you feel this way? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**STEP: 2- Putting it together- again!**

Use the puzzle as a reference to try and reconstruct Pangea using the link below. (If you need help- Click Pangea on) [http://www.geo.cornell.edu/hawaii/220/PRI/PRI\_PT\_contdrift.html#](http://www.geo.cornell.edu/hawaii/220/PRI/PRI_PT_contdrift.html)

Section 6: Extend Yourself

**Step 1 – Extend Yourself (Skip if you do not have enough time)**

*Choose one or all of the heat activities below.*

\_\_\_ BBC: Heat Transfer <http://www.bbc.co.uk/schools/gcsebitesize/science/aqa_pre_2011/energy/heatrev1.shtml>

\_\_\_ Convection & Clouds <http://www.pbslearningmedia.org/resource/ess05.sci.ess.watcyc.convective/convective-cloud-systems/>

\_\_\_ Cool Cosmos: Infrared <http://coolcosmos.ipac.caltech.edu/cosmic_classroom/ir_tutorial/index.html>

Write one sentence describing something new you learned from one of the above extension activities. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**Step 2 – Super Extend Yourself Very Difficult Hoops & soccer Convection Conduction Radiation Game (Pick 1)***Choose one of the heat activities below.*

<http://sciencereviewgames.com/srg/games/hs.php?id=27>

<http://sciencereviewgames.com/srg/games/ps.php?id=27>



Section 7: **Tectonic Plates and Their Boundaries**

**Step 1: Plate Boundaries Introduction**

*Perform the following steps in order. Check off each activity as you complete it.*

BRAIN POP: Login Username and Password: apexmid

\_\_\_ I watched the Brain Pop on plate tectonics.

\_\_\_ I completed my quiz on plate tectonics. I then checked my score. Score \_\_\_\_ of 10.

**Step 2: Plate Boundaries Continued**

Watch the video and answer the questions below: <https://www.youtube.com/watch?v=Kg_UBLFUpYQ>

***Do your best to answer the questions as the video plays. Pause and re-watch as needed.***

***Before you watch the video, please read over the questions so you know what to expect.***

1. Despite being hot enough to melt, our iron and nickel inner core is a solid. Why?
The inner core remains a solid because it is under such extreme pressure.
2. What are the two kinds of crust? Continental crust & ocean crust
3. The continental crust is thicker and older.
4. The ocean crust is thinner and younger.
5. Convection currents in the mantle makes our plates move.



1. Our plates are moving in the following three ways...

Some are moving apart ,

Some are moving towards each other,

Other plates just slide past one another.

1. List some features or events moving plates have created.

Mountain ranges

Earthquakes

Volcanoes

islands

1. Students sometimes think that islands float on the oceans. That is absolutely false. Why did the island form near Greenland?

The island in Greenland was caused by plates moving apart creating a volcano that rose

above the ocean.

1. Wow, the Atlantic Ocean is actually spreading apart! How much larger has the Atlantic Ocean gotten since Columbus sailed the ocean blue? 25 meters .
2. Why did the narrator call the location where plates move apart, constructive margins?

At these locations the plates move apart forming volcanoes that create new land.

1. Why did the narrator refer to the place where plates move together as destructive margins?

At these locations plates coming together can create destructive earthquakes.

1. Why would the narrator refer to the place where two plates scrape past each other as conservative margins? Any answer is accepted here : )
2. Why would the narrator refer to the place where two plates come together as collision zones?
At these locations plates collide or crash together forming large mountains.

**Step 3: More Plate Boundaries**

Go to Interactive Dynamic Earth to define the boundary types below. <http://www.learner.org/interactives/dynamicearth/plate.html>

**Plate Boundary**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Convergent Boundary

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Draw arrows on the two parallelograms below to represent plate movement at a convergent boundary.

Divergent Boundary

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Draw arrows on the two parallelograms below to represent plate movement at a divergent boundary.

Transform Boundary

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Draw arrows on the two parallelograms below to represent plate movement at a transform boundary.

Then go to PBS Plate Tectonic Activity Link. [PBS Plate Tectonics](http://www.pbs.org/wgbh/aso/tryit/tectonics/)
After looking at this section, did it help you understand these concepts? \_\_\_\_\_\_\_

**Step 4: Test your knowledge: The Plate Boundaries Challenge**

Follow the link below to test how well you can apply what you learned about tectonic plate boundaries. <http://www.learner.org/interactives/dynamicearth/plate.html>

Play The Plate Boundaries Challenge Score \_\_\_\_\_\_\_\_

<http://www.learner.org/interactives/dynamicearth/slip3.html>

Now Play Interactions Challenge Score\_\_\_\_\_\_\_

Section 8: Getting Specific with Plate Boundaries

Step 1: Follow the links to define the following terms.

*Go to the following link to observe the 3 boundaries in action.*

<http://www.classzone.com/books/earth_science/terc/content/visualizations/es0804/es0804page01.cfm?chapter_no=08>

**Convergent Boundaries**

*Go to the following links to learn about subduction. Then define it!*<http://earthguide.ucsd.edu/eoc/teachers/t_tectonics/p_subduction.html> (review the illustration only)

<http://wiki.kidzsearch.com/wiki/Subduction>

Subduction

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_­­­­\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

*Go to the following Plate Tectonics Site*. *Click on the “Details” tab.*

<http://ees.as.uky.edu/sites/default/files/elearning/module04swf.swf>

***Use the graphics and Information to define the following Terms*.**

Oceanic-Continental Subduction

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Continental Arcs or Coastal Mountains (same thing)
\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Continental-Continental Collision

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Oceanic-Oceanic Subduction

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Island Arcs

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Divergent Boundaries
*Stay at this site and click on the details tab until you find the following terms. Define each term.*

Continental Rift or Rift Valley
\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Mid Ocean Ridge
\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**TRANSFORM BOUNDARIES**

*Stay at this site and click on the details tab until you find transform. What famous transform boundary is located in the United states\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. What kind of fault is it? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*

**Step 4: Test your knowledge: The Plate Boundaries Challenge**
Take the quiz and record your score here: \_\_\_\_\_\_\_\_\_\_

<http://www.learner.org/interactives/dynamicearth/testskills.html>

Section 9: **Evidence of Sea Floor Spreading**

**Step 1: Watch the videos and answer the questions.**

<https://www.ck12.org/c/earth-science/seafloor-spreading-hypothesis/lecture/Seafloor-Spreading/?referrer=featured_content>

Before WWII why do you think scientists believed the ocean floor was flat like a desert? \_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

<https://www.ck12.org/earth-science/Magnetic-Evidence-for-Seafloor-Spreading/lecture/Magnetic-Field-Reversal/?referrer=featured_content>

Define REVERSAL: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

How does magnetic reversal support the Theory of Plate Tectonics? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

<http://education.sdsc.edu/optiputer/flash/seafloorspread.htm> How does this help you understand sea floor spreading? **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.**

What are some of the pieces of evidence that support sea floor spreading (it’s ok to refer to the previous section of this unit)?

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

Section 10: **Putting it all together: Plate Boundaries!**

Use the link to answer the questions below. <http://www.amnh.org/ology/features/plates/loader.swf>

What concept that we have studied does this animation demonstrate? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Click on 3 red dots of your choice!**

Location 1 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ What type of boundary is this? \_\_\_\_\_\_\_\_\_\_\_\_\_\_

What is occurring that is significant in this area of the world? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Location 2 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ What type of boundary is this? \_\_\_\_\_\_\_\_\_\_\_\_\_\_

What is occurring that is significant in this area of the world? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Location 3 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ What type of boundary is this? \_\_\_\_\_\_\_\_\_\_\_\_\_\_

What is occurring that is significant in this area of the world? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

# Plate Tectonics Raft Assignment

* Choose one of the three plate boundaries as a topic to explain through one of the RAFT options.
* Complete a **RAFT**.
* ***Compose***a creative, accurate, & informative narrative that helps to explain one part of the theory of plate tectonics.

|  |  |  |  |
| --- | --- | --- | --- |
| **Role** | **Audience**  | **Format** | **Topic: The main idea behind the writing; the scientific things you must include** |
| A sports announcer. | sportsfans | A play by play of the action going on between crashing plates. | **convergent plate boundaries:**1. *Define* convergent plate boundaries.2. *Explain* what happens between 2 plates during **subduction**3. *Describe* the **differences** between 3 types of convergent plate boundaries: ocean-to-ocean, ocean-to-continent, & continent-to-continent.4. *Identify* land features, such as trenches, volcanoes, and mountain ranges; *explain* **how** they form & *provide* an **example** of each |

|  |  |  |  |
| --- | --- | --- | --- |
| **Role** | **Audience**  | **Format** | **Topic: The main idea behind the writing; the scientific things you must include** |
| TV Crime Cop | Court of Law | Present evidence to the judge and jury to prove the plates are guilty of moving apart. | **divergent plate boundaries:**1. *Define* divergent plate boundaries.2. *Explain* what happens between 2 plates during **sea floor spreading**3. *Describe* three types of evidence we have that the plates are moving apart based on the rocks along mid-ocean ridges.4. Explain why earthquakes at a mid-ocean ridge do not endanger us in NC. |

|  |  |  |  |
| --- | --- | --- | --- |
| **Role** | **Audience**  | **Format** | **Topic: The main idea behind the writing; the scientific things you must include** |
| Singer  | Fans/Audience | Song  | **transform plate boundaries**1. *Define* transform plate boundaries. *2. Describe* a transform plate boundary in California and *identify* the plates involved by name.3. Why does the transform plate boundary above get stuck?4. Why would someone not want to live in San Francisco? |

|  |  |  |  |
| --- | --- | --- | --- |
| **Role** | **Audience**  | **Format** | **Topic: The main idea behind the writing; the scientific things you must include** |
| Architect/Engineer  | Bankers/Investors | 3D Model with moving parts used to pitch the sale of the Theory of Plate Tectonics. | **plate boundaries**1. A model of convergent and divergent boundaries*2. A subduction zone*3. The mantle and the convection currents4. Identify the tectonic plates used in your model and include the natural geologic events that could occur at the boundaries. |

