Name: _____ Period: _____ Date: _____

Plate Tectonics

Learning Objectives:

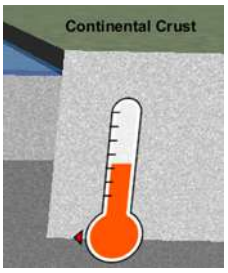
- Describe the differences between oceanic and continental crust, including their respective properties of density, composition, temperature and thickness.
- Predict how changes in composition and temperature change crust density and buoyancy.
- Predict tectonic movement based upon compositional and physical characteristics of each plate.

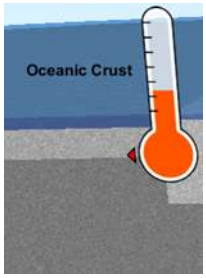
Part 1: Describing differences between oceanic and continental plates

1. Go to: https://phet.colorado.edu/en/simulation/legacy/plate-tectonics
2. Play with the sim (**both tabs**) for 5 minutes. Move **all** dials and buttons!

Crust Tab

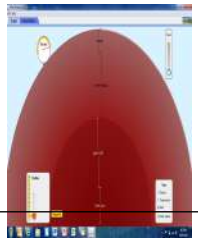
a. Describe the differences in the temperatures in the two pictures. → →





b. What do you think causes the difference in temperature between the 2 types of crust?

c. List all the ways you can change oceanic crust into continental crust using the sliders.

d. Zoom all the way out like this..  and make your View Box look like this. 

Name of Layer	How does this layer's density compare to the picture? 	Why?
	☐ Greater Than ☐ Less Than ☐ Equal to	

	☐ Greater Than ☐ Less Than ☐ Equal to	
	☐ Greater Than ☐ Less Than ☐ Equal to	

Now switch to the "Plate Motion" Tab. Always view "Both", "Show Labels", and "Show Seawater" (*when possible*).

Click on "Manual Mode". Complete the table below using only Manual Mode.

*Note: To see the same action happen again click "Rewind" to change the plates completely click "New Crust".

Example 1: Drag 1 oceanic crust (young) & 1 continental crust onto the screen. Drag the plate in the direction of the GREEN arrow.		
Draw it!	**Type of Boundary?** ☐ Convergent ☐ Divergent ☐ Transform	What is the effect/outcome of this plate movement?

Follow Up Question: What causes the oceanic crust to subduct, or go under the continental crust?

Example 2: Drag 1 oceanic crust (old) & 1 continental crust onto the screen. Drag the plate in the direction of the GREEN arrow.		
Draw it!	**Type of Boundary?** ☐ Convergent ☐ Divergent ☐ Transform	What is the effect/outcome of this plate movement?

Follow Up Question: What causes the oceanic crust to subduct, or go under the continental crust?

Example 3: Drag 2 old oceanic crusts onto the screen. Drag the plate in the direction of the RED arrow.		
Draw it!	**Type of Boundary?** ☐ Convergent ☐ Divergent ☐ Transform	What is the effect/outcome of this plate movement?

Follow Up Question: Where does the "New Crust" come from? Where does the "old crust" go?

Example 4: Drag 2 continental crusts onto the screen. Drag the plate in the direction of the BLUE arrow.		
Draw it!	**Type of Boundary** ☐ Convergent	What is the effect/outcome of this plate movement?

	□ Divergent □ Transform	

Follow Up Question: Why natural hazards are cause by this type of boundary?

Example 2: Drag 2 continental crusts onto the screen. Drag the plate in the direction of the RED arrow.		
Draw it!	**Type of Boundary?** □ Convergent □ Divergent □ Transform	What is the effect/outcome of this plate movement?

Follow Up Question: Where does the "New Crust" come from? Where does the "old crust" go?

Example 3: Drag 2 continental crusts onto the screen. Drag the plate in the direction of the GREEN arrow.		
Draw it!	**Type of Boundary** □ Convergent □ Divergent □ Transform	What is the effect/outcome of this plate movement?

Follow Up Question: Name an area on a map where this has occurred.

➔ **Click "Automatic Mode". Create as many plate boundaries and timelines as you wish!**
Record any interesting observations here:

Analysis Questions:

***You may want to play around with the simulation to help you answer these questions!*

1. a. When you explored the young ocean/continental crust and the old ocean/continental crust, describe the difference in angle of subduction between the old and new plates.

   b. How does the distance between the volcanoes and the plate boundary differ between old and new plates?

2. What is generated at ALL divergent plate boundaries? (red arrows)

3. Which crust, Ocean or Continental…
   a. Is composed of more Silica?

b. Is composed of more Iron?

c. Is denser?

d. Has a greater thickness?