Plate Tectonics Scavenger Hunt

Name _____ Period _____

Go to http://www.geo.cornell.edu/hawaii/220/PRI/PRI_PT_home.html. If the link does not work, type "Cornell Discover Earth" into Google and the site should be the first hit.

1. Plate tectonic processes _____ the surface of the Earth, keeping it in constant motion, constantly _____.

From the main page listed above, click on "Continental Drift" from the left menu and answer the following questions:

2. What did Alfred Wegener observe about the coastlines of Africa and South America?

3. What did this and his other observations lead him to conclude about the location of continents many years ago and now?

Can you reconstruct Pangaea? Click on the "TRY IT" button. Now click on the "Pangaea On" button at the bottom. Click and drag the continents to fit in the outline of Pangaea.

4. List 2 observations about the location of Pangaea compared to the modern day location of the continents.

Close the Pangaea box and click on the "What Do You Think?" link.

5. If you had lived back when Wegener first proposed that continents moved, do you think you would have believed him? Why or why not?

Now click on the link "Earthquakes" from the left column.

6. Earthquakes occur when _____ of the Earth's lithosphere_____. Stored energy is _____; it travels through the Earth as _____.

Click on the word "Go" on the graphic. Draw a diagram of the before and after of the earthquake labeling all the features in the two boxes below.

7. Two plate boundaries, like any two objects, can move in three ways. They can:
    - Move apart, or _____
    - Move together, or _____
    - Move side-to-side, or _____

Now click on "Where do earthquakes occur?"

8. _____ are instruments that detect earthquake waves. Based on the animation, what happens to the red line when an earthquake occurs? _____
9. What is the difference between a P-wave and an S-wave?

   How are these waves used to find out how far away an earthquake is?

Now click on "Where do earthquakes occur?" (again)

10. Choose at least 2 "X's" to click on and record your observations of the earthquake activity that has happened at that location within the time period chosen.

LOCATION	TIME PERIOD	OBSERVATIONS

Now click on "What do you think?"

11. About how many small earthquakes happen each day? _____

Click on "Plate Boundaries" from the left menu. Feel free to explore the chart options of various locations and geologic features. Then click on "What do you think?"

12. Choose two of the observations that make the most sense to you and write here:

Click on "Divergent."

13. Divergent boundaries are places where plates _____. At divergent boundaries, _____ is created as old lithosphere spreads away to either side. _____ are divergent plate boundaries where _____ material wells up to form new lithosphere. Divergent plate boundaries are characterized by shallow _____, volcanic eruptions, a high topographic _____, and very young lithosphere.

14. Draw a picture that will help you remember DIVERGENT PLATE BOUNDARY.

Click on "Convergent."

15. Convergent boundaries are places where one plate _____ .

16. Ocean-to-Ocean and Ocean-to-Continent Convergent zones result in a SUBDUCTION ZONE. Continent-to-continent results in a COLLISION ZONE. Complete the following chart to distinguish the difference.

ZONE	SUBDUCTION	COLLISION
DIAGRAM		
DESCRIPTION/EXAMPLES/FACTS		

Click on "Transform."

17. Transform boundaries are places where plates slide _____ past each other. At transform boundaries, lithosphere is neither created nor _____. Many transform boundaries are found on the _____, where they connect segments of diverging mid-ocean ridges. California's _____ Fault is a transform boundary.

Click on "Plate Motion."

18. How does convection drive the movement of the continental plates?

Click on "Mountains."

19. Mountain ranges are the result of _____. When two plates carrying continental crust converge, crustal rocks are _____and faulted. The result is deformed, _____crust. This thicker crust rests on the underlying _____, floating on the denser mantle rocks just as an _____ floats in water. Mountains also resemble icebergs in that the part you see is much smaller than the part hidden _____ the Earth's surface. The high topography of mountain ranges is mirrored by a much larger crustal root beneath. The _____ of mountains depends on the thickness of the crust, and the difference in density between the crust and the mantle. These relationships are part of the principle of _____, which governs how icebergs, mountains, and all other objects float.

Click on the "Try It" button. Play around with changing the values of the height & density of the mountain (block) and the density of the magma (liquid). Remember there is a reset button to clear to the default values of the earth's crust.

20. What happens when you increase the height of the mountain (block)?

21. What happens when you increase the density of the mountain (block)?

22. How does increasing the density of the magma (liquid) affect the height of the mountain (block)?

23. If a mountain's density decreased, would it become a taller mountain or a shorter mountain? _____

Close the isostasy window and click on "Volcanoes."

24. What is the difference between a shield volcano and a stratovolcano?

25. Describe viscosity.

Click on "What do you think?"

26. The _____ of lava controls viscosity. Lavas with more _____ have higher viscosities because silica forms lots of chemical bonds causing the lava to be very stiff or "sticky." Very little silica is found in the _____, so volcanoes formed along _____ plate boundaries have lava with much lower viscosities than those formed along convergent plate boundaries.
27. Some volcanoes are not found along plate boundaries. These are called _____ volcanoes and form above a single _____ of hot mantle.

Click on "Hot Spots."

28. From looking at the map of hot spots around the world, list 3 places that have hot spots.

29. How do hot spots form chains of islands?