Continental Drift, Plate Tectonics, Earthquakes and Volcanoes Study Guide Answer Sheet

1. Define the following vocabulary: lithosphere, asthenosphere, fault, tectonic plate, Pangaea, earthquake, focus, epicenter, seismic wave
   1. Lithosphere- part of the Earth made of the crust and the top part of the mantle
   2. Asthenosphere- part of the mantle moves around due to the convection currents
   3. Fault- a crack in the lithosphere where rocks move past each other
   4. Tectonic plate- the lithosphere is broken into large pieces, and each of the large pieces is called a tectonic plate
   5. Pangaea- the name given to the supercontinent that is believed to have existed millions of years ago
   6. Earthquake- Shaking of the ground caused by the sudden movement of large blocks of rock along a fault
   7. Focus- the point beneath Earth’s surface where rock breaks under stress and causes an earthquake
   8. Epicenter- The point on Earth’s surface directly above an earthquake’s focus
   9. Seismic wave- Energy from earthquakes which travel in waves. They start as vibrations.
2. What does the Theory of Continental Drift say?
   1. The continents were once all joined together in a supercontinent called Pangaea, and drifted to their current positions over millions of years.
3. What evidence did Alfred Wegener offer to support his theory of Continental Drift?
   1. A map of the continents fit together fit together like a jigsaw puzzle
   2. Land features-Mountain ranges and coal fields were found on separate continents that lined up perfectly
   3. Fossils-fossils of the exact same kinds of plants were found on different continents; fossils of animals that could not swim far were found on continents that were separated by oceans
   4. Climate Change- Fossils of tropical plants were found in the Arctic region, where they could never survive today; evidence of glaciers can be found in mountains in South Africa
4. What evidence did exploration of the ocean floor reveal to further support Wegener's theory?
   1. New crust was being at mid-ocean ridges-the newer crust was closer to the mid-ocean ridge and the older crust was farther away from it
   2. There were strips of ocean floor with alternating magnetic poles
   3. Rocks were found on the ocean floor that had to have been formed when molten material cools.
5. Why didn’t most scientists believe Alfred Wegener’s Theory of Continental Drift when he first proposed it?
   1. He couldn’t explain how the continents moved.
6. What does the Theory of Plate Tectonics say?
   1. The Earth’s lithosphere is broken down into large pieces called tectonic plates, and those tectonic plates are constantly moving very slowly, because of the convection currents in the asthenosphere.
7. What makes the tectonic plates move?
   1. Convection currents in the asthenosphere move the tectonic plates in the lithosphere.
8. Describe the 3 types of plate boundaries, and the movement that occurs at each one.
   1. Convergent boundary- 2 tectonic plates moving toward each other
   2. Divergent boundary- 2 tectonic plates moving away from each other
   3. Transform boundary- 2 tectonic plates slipping past each other in opposite directions
9. What land features or events are formed at each type of plate boundary?
   1. Convergent boundaries- Mountains, Trenches, Volcanoes, Earthquakes
   2. Divergent boundaries- Rift Valleys, Mid-ocean ridges, Volcanoes, earthquakes
   3. Transform Boundaries- Earthquakes
10. What is a mid-ocean ridge and how does it form?
    1. A mountain range at the floor of the ocean,that surrounds a fault, and it is where new oceanic crust is formed. It forms at a divergent boundary under the ocean from sea-floor spreading. .
11. Describe what sea-floor spreading is and how it occurs
    1. Sea-floor spreading is the formation of new oceanic crust on both sides of a mid-ocean ridge. As the tectonic plates pull apart at the divergent boundary, magma rises up through the fault and cools, forming new crust. As the new crust is formed, it pushes the older crust further away from the fault, like a conveyor belt.
12. Name the three types of evidence we studied that supports sea-floor spreading.
    1. Rock samples from oceanic crust found that newer crust was found closer to the mid-ocean ridge and older crust was found further away from the mid-ocean ridge
    2. The oceanic crust at the mid-ocean ridge has matching stripes of rocks with alternating magnetic poles, on each side of the fault.
    3. Rocks were found on the ocean floor that had to have been formed when molten material cools.
13. What is subduction?  Where does it occur and why?
    1. Subduction is when one tectonic plate slides under another tectonic plate. During subduction, crust is destroyed and recycled back into the mantle. It occurs at convergent boundaries and occurs because the 2 tectonic plates have different densities. The more dense plate slides underneath the less dense plate. Oceanic crust is more dense than continental crust. Older oceanic crust is more dense than newer oceanic crust.
14. What role does subduction play in changing the size and shape of oceans?
    1. If more crust is being subducted than is being formed at a mid-ocean ridge, the ocean will shrink. If more crust is being formed at a mid-ocean ridge than is being subducted, then the ocean will grow.
15. Name the 3 types of stresses that act on rocks, and describe which type of boundary they occur at.
    1. Compression is a stress that squeezes rocks together and happens at a convergent boundary
    2. Tension is a stress that pulls rocks apart and happens at a divergent boundary
    3. Shearing is a stress that makes rocks slide past each other in opposite directions, and happens at a transform boundary
16. What is the difference between a hanging wall and a foot wall?
    1. In a normal fault, the block of rock that lies above the fault is the hanging wall. The rock that sits below the fault is the foot wall.
17. Name and describe the 3 types of faults we discussed in class.
    1. Normal fault- the hanging wall slides down below the foot wall. P[
    2. Reverse fault- the hanging wall slides up above the foot.
    3. Strike-slip fault- the rocks on each side of the fault slide horizontally past each other with little up or down motion
18. How are plate boundaries and stresses related?
    1. Stresses are the forces that make tectonic plates move at plate boundaries
19. How are stresses and faults related?
    1. Stresses are the forces that create the different types of faults