**Study Guide**

**Land Beneath Our Feet (Heat, Energy, Plate Tectonics, Rocks and Soil)**

**Vocabulary:**

1. What is heat? How does energy transfer as heat? Energy hot to cold, conduction, convection, and radiation.
2. What is density? The amount of matter in a given space- heavy for its volume.
3. What is equilibrium and what does equilibrium have to do with heat? Temperature is balanced, same. Heat will transfer until the temperature is the same.
4. What is the lithosphere? Crust and upper mantle
5. What is a tectonic plate? Piece of the lithosphere
6. What is a convergent boundary? Plates move together
7. What is a divergent boundary? ? Plates move apart
8. What is a transform boundary? Plates slide or scrape past one another
9. What is a volcano? An opening where lava, gas, steam, fragments, and ash come out.
10. What is an earthquake? The shaking of the earth’s surface caused by the release of tension and stress from within the earth.
11. What is the epicenter and focus of an earthquake? Focus is the point underground where the earthquake originates, epicenter is the point at the surface of the earth directly above the focus.
12. What is a fault? A crack in the crust where there is movement.
13. What is weathering? The breaking down of rocks and plants into smaller pieces.
14. What is erosion? The movement of broken down rocks and plants.

**Know & Understand**

**Energy**:

1. What are the three ways that energy moves as heat? conduction, convection, and radiation.
2. What is friction? Why does it produce heat? The resistance to movement- it produces heat because of the pressure and resistance making the molecules of substances move faster.
3. What is convection (include the term density)? The movement of heat within a material- as the colder, more dense air or water sinks, the less dense material rises.

**Really Know and Understand Heat**

1. If you put an ice cube in the refrigerator, it will melt. In which direction is the heat moving? Hot to cold, from the refrigerator to the ice.
2. If you touch a cold metal flagpole, in which direction will heat move? Hot to cold, from your hand to the flagpole.

**Plate Tectonics:**

1. What is the lithosphere broken into? Tectonic plates
2. Can you list the earth layer and describe each one? Crust- thin, cooled rock- least dense layer. Lithosphere- layer of hard rigid rock- makes up tectonic plates. Asthenospere- hot rock close to melting. Mantle- thickest layer. Outer core- layer of molten iron and nickel. Inner Core- solid ball of iron and nickel- densest layer.
3. What are the theories of Continental Drift & Plate Tectonics? The earth’s crust is cracked into plates that move, the earth was once one supercontinent.
4. List 3 pieces of evidence that prove our tectonic plates move. Fossils-similar fossils in Africa and South America, geology- same rocks in Scotland and Appalachian Mountains, climate- scratches on rocks in South Africa from glaciers and they found fossils of tropical plants in Greenland, age of seafloor.
5. Who was Wegener? German scientist who proposed the theory of continental drift.
6. Why does subduction occur (you better use the term density)? Occurs at a subduction zone because one plate is denser than the other. The denser plate will always sink. If there is an oceanic-oceanic collision or oceanic-continental collision the ocean plate (most dense) will sink.
7. Where and why do most volcanoes occur? ? They occur at plate boundaries because that is where stress builds up.
8. What are smaller earthquakes that occur shortly after a larger earthquake? Aftershocks
9. What forms as a result of a divergent boundary? Mid ocean ridge, new crust
10. What forms as a result of a convergent boundary? Mountains, subduction, rift valleys, trenches
11. What forms as a result of a transform boundary? Earthquakes, faults
12. What do we find in areas with tectonic activity? Earthquakes
13. Which kind of earthquake wave causes the most damage? Surface wave
14. How do scientists know what the inside of the Earth looks like? They examine how seismic waves move through the earth.

**Really Know & Understand Plate Tectonics:**

1. Why do our tectonic plates move (you better use the terms convection and density)? Convection occurs in the mantle. As magma heats it becomes less dense and rises. As it cools nears the surface it becomes denser and sinks. This creates a circular convection current. This moving current drags the plates with it.
2. Where do most earthquakes and volcanoes occur? Why? They occur at plate boundaries because that is where stress builds up.

**In each situation, choose which of the three types of heat transfer is being illustrated.**

1. Getting sunburn while playing volleyball at the beach.- radiation
2. The circling current of heat in a pot of boiling water.- convection
3. Placing a shovel in a pile of red hot coals.- conduction

**Really Know & Understand Rocks and Soil**

1. How are igneous rocks formed?- Melting and cooling
2. How are sedimentary rocks formed?- Weathering and erosion breaks down rock into sediment, layering and cementing.
3. How are metamorphic rocks formed? Heat and pressure deep inside the earth
4. What are the characteristics of fertile soil? Dark color, lots of humus and nutrients
5. What makes soil able to hold water? Size of the particles, pore space
6. What climate type produces soil the fastest? Hot and wet climate, tropical
7. Describe the four soil conservation methods: crop rotation, contour plowing, terraces, and conservation tillage.

-crop rotation:

-contour plowing:

Plowing along contours or curves to reduce water runoff.

-terraces:

Planting step- like structures to reduce water runoff.

-conservation tillage:

 Not plowing as often or as deep.