

## **THIRD QUARTER**

### **II. UNIT 5: PLATE TECTONICS**

**Time:**

**Approximate Dates:**

#### **a. Unit Introduction:**

#### **b. Standards**

1. C20 Explain how the boundaries of tectonic plates can be inferred from the location of earthquakes and volcanoes.

CT State Grade Level Expectations (Draft)

**GRADE-LEVEL CONCEPT 2:** ♦ Volcanic activity and the folding and faulting of rock layers during the shifting of Earth's crust affect the formation of mountains, ridges, and valleys.

#### **GRADE-LEVEL EXPECTATIONS:**

1. Earth's surface features, such as mountains, volcanoes and continents, are the constantly-changing result of dynamic processes and forces at work inside the Earth.
2. Earth is formed of three basic layers, with the densest being the iron and nickel core. The middle layer, the mantle, of the Earth is composed of mostly light elements such as silicon, oxygen and magnesium and is quite plastic because of its high temperature and pressure. The top layer, the crust, is solid but relatively thin, and it supports large land masses (continents) and oceans.
3. The material supporting the earth's crust is broken into different "tectonic plates" that float on the material beneath it and move in small amounts very slowly. Continental drift is driven by convection currents in the hot liquid mantle beneath the crust.
4. The presence of plant and animal fossils of the same age found around different continent shores, along with the matching coastline shapes of continental land masses, provides evidence that the continents were once joined.
5. At the locations where two tectonic plates interact, a boundary exists. There are divergent boundaries (where plates move apart causing trenches and new crust to form), convergent boundaries (where plates push together causing folding, faulting and uplift), and transform boundaries (where plates slide past each other causing a build-up of resistance that can result in earthquakes). Connecticut has a great deal of fault rock evidence of crustal separation.
6. The folding and faulting of rock layers during the shifting of the Earth's crust causes the constructive formation of mountains, ridges and valleys.
7. Mountain formation can be the result of convergent tectonic plates colliding, such as the Appalachians and the Himalayas; mountains may also be formed as a result of divergent tectonic plates moving apart and causing rifting as in East Africa or Connecticut.
8. Most volcanoes and earthquakes are located at tectonic plate boundaries where plates come together or move apart from each other. A geographic plot of the location of volcanoes and the centers of earthquakes allows us to locate tectonic plate boundaries.

9. The geological makeup of Connecticut shows evidence of various earth processes, such as continental collisions, rifting, and folding that have shaped its structure.

**SCIENTIFIC LITERACY TERMINOLOGY:** Erosion, weathering, glacier, valley, floodplain, core, mantle, folds, fault/fault line, continent, tectonic plate, plate boundary, convection, mountains, volcano, earthquake.

### **c. Essential Questions**

1. How do the characteristics of Earth's crust, mantle, and core differ?
2. What causes convection currents in Earth's mantle?
3. How does the theory of plate tectonics explain the formation, movement, and subduction of Earth's plates?
4. What type of movement occurs at each plate boundary? How do the movements affect earth's crust?

### **d. Essential Concepts**

1. Earth's interior is made up of three main layers; the crust, the mantle, and the core. These layers vary greatly in size, composition, temperature, and pressure.
2. Convection is the heat transfer by the movement of currents within a fluid. Heating and cooling of the fluid mantle, changes in density and gravity combine to cause convection currents in the mantle.
3. The movement of convection currents in the mantle is the major force that causes plate movements.
4. As the plates move, they collide pull, apart, or grind past each other, they change Earth's surface causing earthquakes and creating, among other things, mountains, volcanoes, and deep ocean trenches.

### **e. Essential Skills**

### **f. Vocabulary**

- |                |                         |
|----------------|-------------------------|
| 1. crust       | 7. convection           |
| 2. mantle      | 8. radiation            |
| 3. core        | 9. density              |
| 4. pressure    | 10. convection current  |
| 5. temperature | 11. continental drift   |
| 6. conduction  | 12. sea-floor spreading |

13. deep-ocean trench
14. subduction
15. plate tectonics
16. boundary
17. divergent boundary

18. convergent
19. boundary
20. transform boundary
21. earthquake
22. volcano

**g. Suggested Activities/Labs**

RFI: [Alfred Wegner](#)

[Pangea](#)

[Plate Asssign](#)

[CandyQuakes](#)

[How Stress Affects the Earth](#)

[Floating Continents](#)

[Convection Mantle](#)

[Snicker](#)