**Plate Tectonics**

**Description:**

The plate tectonics theory is the great unifying theme explaining the origin of the continents, ocean basins, and mountain ranges; many facts of evolution; and locations of earthquakes and volcanoes. Chapter 9 introduces students to the lithosphere of the earth as a dynamic system of rigid plates.

**Textbook Chapters:**

**9**. Plate Tectonics

**Section 1: Continental Drift**

**Section 2: Sea Floor Spreading**

**Section 3: The Theory of Plate Tectonics**

**Section 4: Mechanics of Plate Motions**

**State Standards:**

E.S. 1.24 Understand and discuss continental drift, sea-floor spreading, and plate tectonics. Include evidence that supports the movement of the plates, such as magnetic strips on the ocean floor, fossil evidence on separate continents, and the continuity of geologic features.

E.S.2.6 Describe that early in the twentieth century the German scientist Alfred Wegener reintroduced the idea of moving continents, adding such evidence as the underwater shapes of the continents, the similarity of life forms and land forms in corresponding parts of Africa and South America, and the increasing separation of Greenland and Europe. Also know that very few contemporary scientists adopted his theory because Wegener was unable to propose a plausible mechanism for motion.

E.S. 2.7 Explain that the theory of plate tectonics was finally accepted by the scientific community in the 1960’s when further evidence had accumulated in support of it. Understand that the theory was seen to provide an explanation for diverse array of seemingly unrelated phenomena and there was a scientifically sound physical explanation of how such movement could occur.

**Objectives:**

9.1 Continental Drift, pp. 248–253

9.1 Describe the hypothesis of continental drift.

9.2 Evaluate the evidence in support of continental drift.

9.3 Identify the main objections to Wegener’s hypothesis of continental drift.

9.2 Sea-Floor Spreading, pp. 254–260

9.4 Identify mid-ocean ridges and deep-ocean trenches.

9.5 Explain the processes of sea-floor spreading and subduction.

9.6 Explain the evidence for sea-floor spreading, including paleomagnetism and magnetic reversals, earthquake patterns and the age of the ocean floor.

9.3 Theory of Plate Tectonics, pp. 261–268 L2

9.7 Explain the theory of plate tectonics.

9.8 Describe lithospheric plates.

9.9 Identify the three types of plate boundaries.

9.4 Mechanisms of Plate Motions, pp. 270–271

9.10 Relate the unequal distribution of heat in Earth and the mechanism of mantle convection to the movement of tectonic plates.

9.11 Compare the mechanisms of slab-pull and ridge-push as contributing to plate motion.

**Learning Activities:**

1. Discussion/Lecture on Continental Drift

2. Discussion/Lecture on Sea-Floor Spreading and Convection Currents

3. What if Pangaea had Never Broken Up? Web Quest

4. Chapter 9 Review

5. Plate Tectonics Test