Connecting to the Next Generation Science Standards

**Standard**

**MS ESS 2: Earth Systems**

**Performance Expectation(s)**

*The chart below makes one set of connections between the instruction outlined in this article and the NGSS. Other valid connections are likely; however, space restrictions prevent us from listing all possibilities. The activities outlined in this article are just one step toward reaching the performance expectations listed below.*

**MS-ESS2-3.** Analyze and interpret data on the distribution of fossils and rocks, continental shapes, and seafloor structures to provide evidence of the past plate motions. (Core PE)

**MS-ESS2-2.** Construct an explanation based on evidence for how geoscience processes have change Earth’s surface at varying time and spatial scales.

**MS-ESS2-1.** Develop a model to describe the cycling of Earth’s materials and the flow of energy that drives this process.

**Science and Engineering Practices**

**Analyzing and Interpreting Data**

* Use graphical displays (e.g. maps, charts, graphs, and/or tables) or large data sets to identify temporal and spatial relationships.

***Classroom Connections***

Students analyze fossil data to reconstruct Pangaea and analyze and correlate earthquake, volcanic, topographic, and geochronology data to infer movements of Earth’s lithospheric plates.

**Constructing Explanations**

* Apply scientific ideas, principles, and/or evidence to construct, revise and/or se an explanation for real-world phenomena, examples, or event

***Classroom Connections***

Students construct an initial and revised model to explain (a) why Connecticut’s landmass (i.e., present-day North America) shifted position resulting in a change from a tropical to temperature climate, and (b) how the topography of Connecticut changed due to plate collisions and spreading apart.

**Disciplinary Core Ideas**

**ESS2.B: Plate Tectonics and Large Scale System Interactions**

* Maps of ancient land and water patterns, based on investigations of rocks and fossils, make clear how Earth’s plates have moved great distances, collided, and spread apart.

***Classroom Connections***

Students use and analyze patterns of geoscience spatial data such as fossils evidence as well as earthquake and topographic data and relate this evidence to the movements of earth’s lithospheric plates.

**ESS1.C: The History of Planet Earth**

* Tectonic processes continually generate new ocean sea floor at ridges and destroy old sea floor at trenches.

***Classroom Connections***

Students calculate the rate of plate motion, specifically using the age of oceanic crust by how far it is from a spreading center and then recognize that ocean rock progressively becomes older the further it is from the spreading center.

**ESS2.A: Earth’s Materials and Systems**

* All Earth processes are the result of energy flowing and matter cycling within and among the planet’s systems. This energy is derived from the sun and Earth’s hot interior. The energy that flows and matter that cycles produce chemical and physical changes in Earth’s materials and living organisms.

***Classroom Connections***

Students describe what drives the movement of lithospheric plates, which is based on internal convection currents of fluid rock material within the Earth’s core and how that affect plate movement over large temporal and spatial scales.

**Crosscutting Concepts**

**Patterns**

* Graphs, charts, and images can be used to identify patterns in data

***Classroom Connections***

Students qualitatively infer movements of Earth’s lithospheric plates based on geoscience spatial data as well as quantitatively calculating the rate of motion of lithospheric plates.

**Stability and Change**

* Explanations of stability and change in natural or designed systems can be constructed by examining the changes over time and processes at different scales, including the atomic scale.

***Classroom Connections***

Students understand the movements of Earth’s lithospheric plates change over longer periods of time as plate collide and spread apart create new topographical features such as mountains and oceanic trenches.

**Connections to the Common Core State Standards**

**ELA- Literacy in Science and Technical Subjects**

RST.6-8.7 Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).

WHST.6-8.2 Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.