Unit 2 - Plate Motion

Content Area: **Science**
Course(s):
Time Period: **Full Year**
Length: **Full Year**
Status: **Published**

Unit Overview

Students will investigate a fossil mystery: why are fossils of Mesosaurus, a population of extinct reptiles that once lived all together, now found separated by thousands of kilometers of ocean? After determining that there is a plate boundary between these groups of fossils, students determine whether the fossils were separated suddenly as a result of one geologic event, or slowly over millions of years. Students explore plates and plate boundaries through a series of hands-on investigations and engaging articles and videos featuring real-life scientists. Using the Plate Motion Simulation, students create continents, set plates in motion, and watch what happens. By the end of the unit, students are able to explain that plates are destroyed and rock is added to plates constantly and slowly (and these processes have been occurring for millions of years) due to large-scale plate movement.

Enduring Understandings

Earth's outer layer is made of hard, solid rock.
Earth's outer layer is divided into sections called plates.
Geologists look for patterns in landforms and in geologic events in order to better understand Earth.
The plates of Earth's outer layer move.
Earth's plates move on top of a soft, solid layer of rock called the mantle.
At divergent plate boundaries, rock rises from the mantle and hardens, adding new solid rock to the edges of both plates.
At convergent plate boundaries, one plate moves underneath the other plate and sinks into the mantle.

Essential Questions

What is the land like underneath Earth's surface?
How do Earth's plates move?
What happens to the plates and the mantle at plate boundaries?
What do we know about plate motion that is currently taking place?
What evidence do we have of past plate motion?

Learning Objectives

Earth, Mars, and other rocky planets can be thought of as systems. These systems are made up of interacting spheres that can include the geosphere, atmosphere, hydrosphere, and biosphere.
When landforms on different rocky planets look similar, it is evidence that they may have been formed by the same geologic process.

Scientists can use models to test their ideas and get evidence about processes in the natural world that are difficult to observe.
Landforms can provide evidence about the past because they remain after the geologic processes that formed them stop happening.
Models represent the natural processes being investigated in important ways, but they are not exactly the same.

Standards: Content

MS-ESS1-3	Analyze and interpret data to determine scale properties of objects in the solar system.
MS-ESS2-2	Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales.

Standards: Interdisciplinary

Assessment Evidence

Formative	Teacher observations, Class discussions, Lab Activities, Key concepts and vocabulary quizzes, Warm Ups, Open Ended Responses, Modeling, Simulations, Innovators Monthly Research
Summative	In correlation with the NJSLS, students must demonstrate the following as summative assessments: MS-ESS1-3 - Analyze and interpret data to determine scale properties of objects in the solar system. MS-ESS2-2 - Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales. Other summative assessments will include but are not limited to: projects, summative tests, lab skills
Alternative & Benchmark	Alternative - Read to the student and chart oral responses. Word banks, sentence frames, oral responses, graphic organizers, observations, portfolios of student work, orally administered assessments, and anecdotal notes. Benchmark – LinkIt Benchmark Assessment, Teacher Generated Assessments
Assessment Evidence Resource	

Instructional Resources

Instructional Resource List

Curricular Mandates

Below are the curricular requirements as defined in NJ Administrative Code and Statute

	Amistad		Diversity, Equity, and Inclusion
	Holocaust		LGBT and Disabilities (Grades 6-12)
	Climate Change		Asian American & Pacific Islander

Social Emotional Learning (SEL) Competencies

NJ Social and Emotional Learning Competencies & Sub-Competencies

	Self-Awareness		Relationship Skills
X	Responsible Decision-Making		Social Awareness
	Self-Management		

21st Century Skills & Themes

	Global and Cultural Awareness	X	Technology Literacy		Planning and Budgeting
X	Creativity and Innovation		Financial Institutions		Risk Management and Insurance
X	Information and Media Literacy		Digital Citizenship		Economic and Government Influences
X	Critical Thinking and Problem Solving		Credit Profile		Career Awareness and Planning
	Civic Financial Responsibility		Financial Psychology		