2019 Unit 2 Geosphere

Content Area: **Science**
Course(s): **Environmental Science**
Time Period: **October**
Length: **30 instructional days**
Status: **Published**

Enduring Understandings:

- Energy drives the cycling of matter within and between Earth's systems.
- Science includes the process of coordinating patterns of evidence with current theory.
- Continental rocks, which can be older than 4 billion years, are generally much older than the rocks of the ocean floor, which are less than 200 million years old.
- Earth with a hot but solid inner core, a liquid outer core, and a solid mantle and crust.
- Empirical evidence is needed to identify patterns in crustal rocks.
- Evidence from deep probes and seismic waves, reconstructions of historical changes in Earth's surface and its magnetic field, and an understanding of physical and chemical processes lead to a model of the Earth.
- Geologists use seismic waves and their reflection at interfaces between layers to probe structures deep in the planet.
- Nuclear lifetimes allow radiometric dating to be used to determine the ages of rocks and other materials.
- Science disciplines share common rules of evidence used to evaluate explanations about natural systems.
- Science knowledge is based on empirical evidence.
- Spontaneous radioactive decay follows a characteristic exponential decay law.
- The radioactive decay of unstable isotopes continually generates new energy within Earth's crust and mantle, providing the primary source of the heat that drives mantle convection. Plate tectonics can be viewed as the surface expression of mantle convection.

Essential Questions:

- Are all rocks the same age?
- Empirical evidence is needed to identify patterns in crustal rocks.
- How much force is needed to move a continent? What can possibly provide the energy for that much force?

Lesson Titles:

- Earth's Structure and Dynamics
- Faulting
- Radioactivity
- Stratigraphy
- The Geopsphere- Composition of the Earth

Career Readiness, Life Literacies & Key Skills

WRK.K-12.P.1	Act as a responsible and contributing community members and employee.
WRK.K-12.P.4	Demonstrate creativity and innovation.
WRK.K-12.P.5	Utilize critical thinking to make sense of problems and persevere in solving them.
WRK.K-12.P.8	Use technology to enhance productivity increase collaboration and communicate effectively.
WRK.K-12.P.9	Work productively in teams while using cultural/global competence.

Inter-Disciplinary Connections:

LA.RL.9-10.1	Cite strong and thorough textual evidence and make relevant connections to support analysis of what the text says explicitly as well as inferentially, including determining where the text leaves matters uncertain.
MA.A-SSE.A.1a	Interpret parts of an expression, such as terms, factors, and coefficients.
LA.RL.9-10.2	Determine a theme or central idea of a text and analyze in detail its development over the course of the text, including how it emerges and is shaped and refined by specific details and provide an objective summary of the text.
LA.RH.9-10.3	Analyze in detail a series of events described in a text; draw connections between the events, to determine whether earlier events caused later ones or simply preceded them.
LA.RH.9-10.4	Determine the meaning of words and phrases as they are used in a text, including vocabulary describing political, social, or economic aspects of history and the social sciences; analyze the cumulative impact of specific word choices on meaning and tone.
LA.RL.9-10.4	Determine the meaning of words and phrases as they are used in the text, including figurative and connotative meanings; analyze the cumulative impact of specific word choices on meaning and tone (e.g., how the language evokes a sense of time and place; how it sets a formal or informal tone).
MA.A-CED	Creating Equations
MA.A-REI.A	Understand solving equations as a process of reasoning and explain the reasoning
MA.A-REI.C	Solve systems of equations
MA.A-REI.D.10	Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).
SOC.9-12.1.3.1	Distinguish valid arguments from false arguments when interpreting current and historical events.
SOC.9-12.1.3.2	Evaluate sources for validity and credibility and to detect propaganda, censorship, and bias.
SOC.9-12.1.4.2	Demonstrate effective presentation skills by presenting information in a clear, concise, and well-organized manner taking into consider appropriate use of language for task and audience.

Instructional Strategies, Learning Activities, and Levels of Blooms/DOK:

- Ecological Footprint Chromebook Act.

- Phosphorus Cycle Act. Sht.
- Current Event article on geology
- Density of The Earth Lab
- Design and Earthquake proof building lab
- Design and Earthquake proof building lab
- Draw internal structure of the Earth to scale
- Erosion Lab
- Fault Model Lab
- Faults and Folds Activity Sheet
- Faults and Folds Chromebook Act.
- Faults Diagram
- Faults Labeling Activity Sht.
- Fun W/ Stratigraphy Act. Sht
- Geothermal Act. Sht.
- Geothermal Lab
- Index Fossil Lab
- Interpreting Rock act. sht
- Interpreting Rock Act. Sht.
- Magnetic Reversal Act. Sht.
- Magnetic Reversal Lab
- Mining Cooking Lab
- Paleomagnetism Activity Sheet
- Plate Boundaries Lab
- Rate of Oceanfloor Spreading activity
- Rock Cycle Act. Sht.
- Soil Lab
- Soil Profile Act. Sht.
- Specific Gravity Lab
- Structure of the Earth Chromebook Activity
- Subsurface changes Act. Sheet

Modifications

Benchmark Assessments

Skills-based assessment

Reading response

Writing prompt

Lab practical

Formative Assessment:

- Anticipatory Set
- Closure
- Lab Reports on Faults, Soil lab, Mining Lab, Index Fossil Lab
- Warm-Up

Summative Assessment:

- Lab Practical
- Marking Period 1 Assessment
- Project on Soil Pollution and Land Use
- Unit 2 Exam on Layers, Minerals, Mining and Soil

Alternative Assessments

Performance tasks

Project-based assignments

Problem-based assignments

Presentations

Reflective pieces

Concept maps

Case-based scenarios

Portfolios

Resources & Materials:

- Fault models
- Faults and Folds: http://tinyurl.com/lzogufs
- Geothermal Activity: http://tinyurl.com/kmsdl4e
- Interior layers of the Earth to scale
- Structure of the Earth: http://tinyurl.com/kpyl9rr
- Structure of the Earth: http://tinyurl.com/kpyl9rr
- Supplies for Building Engineering: trays, marbles, toothpicks, marshmallows
- Virtual Epicenter: http://tinyurl.co/7dsbdmz