Marietta City Schools

District Unit Planner

Everything on the unit planner must be included on the unit curriculum approval statement.

Science Grade 6 Advanced Studies

Unit title	*Earth's Changing Landscape- Part 11 Rocks and Minerals*	**MYP year**	1	**Unit duration (hrs)**	22.5 Hours

GSE Standards

Standards

S6E5. Obtain, evaluate, and communicate information to show how Earth's surface is formed.

b. Plan and carry out an investigation of the characteristics of minerals and how minerals contribute to rock composition.

c. Construct an explanation of how to classify rocks by their formation and how rocks change through geologic processes in the rock cycle.

d. Ask questions to identify types of weathering, agents of erosion and transportation, and environments of deposition. (Clarification statement: Environments of deposition include deltas, barrier islands, beaches, marshes, and rivers.)

e. Develop a model to demonstrate how natural processes (weathering, erosion, and deposition) and human activity change rocks and the surface of the Earth.

g. Construct an argument using maps and data collected to support a claim of how fossils show evidence of the changing surface and climate of the Earth

h. Plan and carry out an investigation to provide evidence that soil is composed of layers of weathered rocks and decomposed organic material

S6E6. Obtain, evaluate, and communicate information about the uses and conservation of various natural resources and how they impact the Earth.

b. Design and evaluate solutions for sustaining the quality and supply of natural resources such as water, soil, and air.

c. Construct an argument evaluating contributions to the rise in global temperatures over the past century. (Clarification statement: Tables, graphs, and maps of global and regional temperatures and atmospheric levels of greenhouse gases, such as carbon dioxide and methane, should be used as sources of evidence.)

GSE Sixth grade clarifications

Gifted Standards

Strand 2: Creative Thinking Skills: Students will develop and utilize creative thinking through a variety of products and problem-solving.

Strand 3: Higher Order Thinking and Problem- Solving Skills: Students will develop and utilize critical thinking, higher order thinking, logical thinking and problem solving skills in various situations.

Strand 4: Advanced Communication and Collaboration Skills: Students will develop advanced communication and collaboration skills in working toward a common goal with shared accountability for the final outcome.

Strand 5: Emotional Development of Self: Students will develop understanding of self and how one's own unique abilities influence interactions with others.

Prior Student Knowledge: (REFLECTION – PRIOR TO TEACHING THE UNIT)

S3E1. Obtain, evaluate, and communicate information about the physical attributes of rocks and soils.

a. Ask questions and analyze data to classify rocks by their physical attributes (color, texture, luster, and hardness) using simple tests. (Clarification statement: Mohs scale should be studied at this level. Cleavage, streak, and the classification of rocks as sedimentary, igneous, and metamorphic are studied in sixth grade.)

b. Plan and carry out investigations to describe properties (color, texture, capacity to retain water, and ability to support growth of plants) of soils and soil types (sand, clay, loam).

c. Make observations of the local environment to construct an explanation of how water and/or wind have made changes to soil and/or rocks over time. (Clarification statement: Examples could include ripples in dirt on a playground and a hole formed under gutters.)

S3E2. Obtain, evaluate, and communicate information on how fossils provide evidence of past organisms.

a. Construct an argument from observations of fossils (authentic or reproductions) to communicate how they serve as evidence of past organisms and the environments in which they lived.

b. Develop a model to describe the sequence and conditions required for an organism to become fossilized. (Clarification statement: Types of fossils (cast, mold, trace, and true) are not addressed in this standard.)

S6E5. Obtain, evaluate, and communicate information to show how Earth's surface is formed.

a. Ask questions to compare and contrast the Earth's crust, mantle, and inner and outer core, including temperature, density, thickness, and composition.

Concepts/Skills to be Mastered by Students

- Mineral Formation
- Rock Strata
- Rock Cycle
- Weathering
- Erosion
- Land Features
- Deposition
- Thermal Energy Transfer

Key Vocabulary: (KNOWLEDGE & SKILLS)

Minerals, Rocks, Igneous (Intrusive, Extrusive), Magma, Lava, Sedimentary, Compaction, Cementation, Metamorphic, Pressure, Heat, Rock Cycle, Weathering, Physical/Mechanical (Ice wedging, Abrasion, Pressure release (exfoliation), Plant root growth, Animal burrowing) , Chemical (Oxidation (rust), acid rain, Lichen), Erosion (Mass wasting, V and U valley), Deposition (deltas, barrier islands, beaches, rivers, marshes), Formation, Sediment, Humus, Soil Horizon, Soil Profile, Topsoil, Chemical pollutants, Conservation (Terracing, Windbreaks, Contour plowing, Crop rotation, Conservation tillage)

Year-Long Anchoring Phenomena: (LEARNING PROCESS)

Earth is the only planet in our solar system that is able to support life.

Unit Phenomena (LEARNING PROCESS)

What drives weathering, erosion, and depositions, and how do these processes impact Earth's surface?

Indian Springs (GaDOE Instructional Segment)

Ellison Cave - In this video of Cloudland Canyon, Allen Padgett from the Department of Natural Resources explains how caves and valleys in North Georgia were formed.

Possible Preconceptions/Misconceptions: (REFLECTION – PRIOR TO TEACHING THE UNIT)

- Students may think that shiny objects are all minerals and dull ones are rocks.
- Student may classify all rocks or minerals using only physical characteristics (color, weight, shape) ● Students may believe that rocks and minerals are the same thing.
- Students may not realize how much they use and need minerals and rocks.
- Students may think that all rocks are the same and made by the same process.

Key concept	Related concept(s)	Global context
Change Change is a conversion, transformation, or movement from one form, state, or value to another. Inquiry into the concept of change involves understanding and evaluating causes, processes, and consequences.	Transformation (MYP) Energy (MYP/CCC)	**Scientific and Technical Innovation** Students will explore the natural world and its laws, the interaction between people and the natural world, how humans use their understanding of scientific principles, the impact of scientific and technological advances on communities and environments, the impact of environments on human activity, and how humans adapt environments to their needs.

Statement of Inquiry

Scientific and technical innovations allow us to visualize, model, and explain changes to the Earth's surface.

Inquiry questions

Factual—

What are the characteristics of rocks and minerals?
What is soil made of?

Conceptual—

How do rocks change?

Debatable-

Should farmers be held responsible for damage related to soil erosion?

MYP Objectives	Assessment Tasks

*What specific MYP **objectives** will be addressed during this unit?*	***Relationship** between summative assessment task(s) and statement of inquiry:*	*List of common formative and summative assessments.*
MYP B- Inquiring and Designing MYP C- Processing and Evaluating	**MYP B-** LabAids- Geological Projessess 5 -Modeling Volcanic Eruptions- Students consider how volcanic eruptions form igneous rock as they model the effects of two different kinds of volcanic eruptions. **MYP C**- LabAids- Geological Processes 18- Evaluating Site Students gather and analyze data about four proposed sites in the contiguous United States in which to store nuclear waste. Students use these data as evidence to support their decision about which of the proposed sites should be studied further to determine if it is suitable for long-term storage of nuclear waste. Students consider the trade-offs of their decisions.	**Mid- Unit Assessment(s):** Rocks and Minerals, Weathering, Erosion, Deposition **Summative Assessment(s):** Earth's Changing Landscape II Unit Assessment and Paper II

Approaches to Learning (ATL)
Category: Thinking; Communication, Collaboration **Cluster:** Critical-Thinking **Skill Indicator:** Use models and simulations to explore complex systems and issues. Gather and organize relevant information to formulate an argument. Collaborate with peers and experts using a variety of digital environments and media. Working effectively with others.

Learning Experiences

Objective or Content	Learning Experiences	Personalized Learning and Differentiation
S6E5. Obtain, evaluate, and communicate information to show how Earth's surface is formed. c. Construct an explanation of how to classify rocks by their formation and how rocks change through geologic processes in the rock cycle.	Lab Aid Geological Processes Activity 15 Rock Cycle students will play a rock cycle game that models how different rocks are formed and then synthesize their experiences to develop a model of the rock cycle.	● Lab-Aids Experiences (individual and collaborative activities) ● Capstone Connections ● Choice of product creation

S6E6. Obtain, evaluate, and communicate information about the uses and conservation of various natural resources and how they impact the Earth. b. Design and evaluate solutions for sustaining the quality and supply of natural resources such as water, soil, and air.	Lab Aid Geological Processes Activity 16 Rocks as a Resource:Students read about the geological processes that led to the formation of three natural resources. They learn that many natural resources only form by particular geological processes and over a very long time, making them scarce and nonrenewable. Students consider the advantages and disadvantages of storing nuclear waste near valuable natural resources.	
S6E5. Obtain, evaluate, and communicate information to show how Earth's surface is formed. e. Develop a model to demonstrate how natural processes (weathering, erosion, and deposition) and human activity change rocks and the surface of the Earth.	LabAids- Land, Water, Human Interaction- Activity 7-In Part A, students use a river model to investigate how flowing water erodes and deposits sediments to create common landforms. Part B is an engineering design challenge where students design erosion-control structures and then use the river model to test them. Based on the results of their initial testing, students redesign and retest their structures.	

Content Resources
LabAids, BrainPop, Edpuzzle
Capstone Connections Students will complete Action Plan D and then submit it. They will then conference with their families and turn in the Capstone Family Approval letter.