



## 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	<i>Earth's Changing Landscape- Part 2 Rocks and Minerals</i>	MYP year	1	Unit duration (hrs)	22.5 Hours
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**Mastering Content and Skills through INQUIRY (Establishing the purpose of the Unit):** *What will students learn?*

#### 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

##### [GSE Sixth grade clarifications](#)

##### **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.)

##### **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

**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)**

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
<b>Change</b> 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)	<b>Scientific and Technical Innovation</b> 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; how humans adapt environments to their needs.
<b>Statement of inquiry</b>		
Scientific and technical innovations allow us to visualize, model, and explain changes to the Earth's surface.		
<b>Inquiry questions</b>		
<b>Factual—</b>  What are the characteristics of rocks and minerals? What is soil made of?  <b>Conceptual—</b>  How do rocks change?  <b>Debatable—</b>  Should farmers be held responsible for damage related to soil erosion?		
MYP Objectives	Assessment Tasks	
What specific MYP <b><u>objectives</u></b> will be addressed during this unit?	<b><i>Relationship</i></b> between summative assessment task(s) and statement of inquiry:	<b><i>List of common formative and summative assessments.</i></b>

<p>Criterion A: Knowing and Understanding</p> <p>ii. Apply scientific knowledge and understanding to solve problems set in familiar situations and suggest solutions to problems set in unfamiliar situations</p> <p>iii. Interpret information to make scientifically supported judgments</p> <p>Criterion C: Processing and Evaluating</p> <p>i. present collected and transformed data</p> <p>ii. interpret data and outline results using scientific reasoning</p> <p>iii. discuss the validity of a prediction based on the outcome of the scientific investigation</p> <p>iv. discuss the validity of the method</p> <p>v. describe improvements or extensions to the method</p> <p>Criterion D: Reflecting on the Impacts of Science</p> <p>iii. apply scientific language effectively</p> <p>outcome of the scientific investigation</p> <p>iv. discuss the validity of the method</p>	<p><b>MYP B- b.</b> Plan and carry out an investigation of the contribution of minerals to rock composition. - Analyze and interpret data to construct an explanation- Classify rocks and minerals: students will analyze and interpret data on the different types of rocks and minerals to classify them. How do geologists classify rocks and minerals?</p> <p><b>MYP C- h.</b> Plan and investigate to provide evidence that soil comprises layers of weathered rocks and decomposed organic material. -- Plan and carry out an investigation- Students will devise a list of characteristics to determine the type of each soil sample. Why are different types of soil composed of different items?</p>	<p><b><u>Formative Assessment(s):</u></b></p> <p>S6E5 Rocks and Minerals CFA in AMP</p> <p>S6E5 Weathering, Erosion, Deposition CFA in AMP</p> <p><b><u>Summative Assessment(s):</u></b></p> <p>MYP B- Classifications of Rock and Minerals</p> <p>MYP C- Soil Layer Investigation</p> <p>MYP D- Rocks as Resources LabAids Lesson 16 Geological Process</p> <p>Paper 1- Multiple choice Unit Exam in AMP</p> <p>Paper 2- CER in AMP</p>
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v. describe improvements or extensions to the method  Criterion D: Reflecting on the Impacts of Science  iii. apply scientific language effectively		
<b>Approaches to learning (ATL)</b>		
<b>Category:</b> Thinking <b>Cluster:</b> Critical-Thinking <b>Skill Indicator:</b> Use models and simulations to explore complex systems and issues. Gather and organize relevant information to formulate an argument.		

<u><b>Learning Experiences</b></u>		
<b>Objective or Content</b>	<b>Learning Experiences</b>	<b>Personalized Learning and Differentiation</b>
<b>S6E5. Obtain, evaluate, and communicate information to show how Earth's surface is formed.</b> 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 Lesson 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.	<ul style="list-style-type: none"> <li>• Lab-Aids Experiences (individual and collaborative activities)</li> <li>• Capstone Connections</li> <li>• Choice with product creation</li> </ul>
<b>S6E6. Obtain, evaluate, and communicate information about the uses and conservation of various natural resources and how they impact the Earth.</b> b. Design and evaluate solutions for sustaining the quality and supply of natural resources such as water, soil, and air.	Lab Aid Geological Processes Lesson 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 are only formed by particular geological processes over a very long time, making them scarce and nonrenewable.	

<p><b>S6E5. Obtain, evaluate, and communicate information to show how Earth's surface is formed.</b></p> <p>c. Construct an explanation of how to classify rocks by their formation and how rocks change through geologic processes in the rock cycle.</p>	<p>Lab Aid Modeling Rock Layers Lesson 9 Students will model the formation of the rock layers of Earth's crust by dropping plastic chips into a cylinder. The class compares data and develops the idea that the ongoing deposition of sediments forms some layers and that lower layers are usually older than the upper layers.</p>	
<p><b>Content Resources</b></p>		
<p>Lab Aids Teacher content created powerpoints Brain pop content videos Edpuzzle content videos Gizmo content simulations</p>		
<p><b>Capstone Connections</b></p> <p>LabAid Geological Processes Lesson 16 Rocks as a Resources: Students read about the geological processes that led to the formation of three natural resources. They learn that many natural resources are only formed by particular geological processes over a long time, making them scarce and nonrenewable. The capstone connection with this activity will allow students to reflect and think about solving a problem when scarce and nonrenewable items are key to helping develop the solution.</p> <p>MSGA Weathering, Erosion, and Deposition Survey Students will review environmental sustainability issues when weathering, erosion, and deposition occur around our school grounds. Students will come up with solutions to the issues they identify. Having students develop solutions for this activity allows them to continue the thought process as to how to create solutions tied to a problem.</p>		

