Marietta City Schools

2024-2025 District Unit Planner

Science Grade 6 Advanced Studies

Unit title	*Earth's Changing Landscapes Part 1 Plate Tectonics*	**MYP year**	1	**Unit duration (hrs)**	20 Hours

GSE Standards

Standards

S6E3. Obtain, evaluate, and communicate information to recognize the significant role of water in Earth's processes.

c. Ask questions to identify and communicate, using graphs and maps, the composition, location, and subsurface topography of the world's oceans.

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.

f. Construct an explanation of how the movement of lithospheric plates, called plate tectonics, can cause major geologic events such as earthquakes and volcanic eruptions. (Clarification statement: Include convergent, divergent, and transform boundaries.)

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.

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)

S5E1. Obtain, evaluate, and communicate information to identify surface features on the Earth caused by constructive and/or destructive processes.

a. Construct an argument supported by scientific evidence to identify surface features (examples could include deltas, sand dunes, mountains, and volcanoes) as being caused by constructive and/or destructive processes (examples could include deposition, weathering, erosion, and impact of organisms).

b. Develop simple interactive models to collect data that illustrate how changes in surface features are/were caused by constructive and/or destructive processes.

c. Ask questions to obtain information on how technology is used to limit and/or predict the impact of constructive and destructive processes.

Concepts/Skills to be Mastered by Students

- Plate Tectonics
- Land Features
- Catastrophic Events
- Geologic Time Scale

Key Vocabulary: (KNOWLEDGE & SKILLS)

Earth's Layers	Tectonic Plates	Ocean Floor Features	Volcanoes	Earthquakes
Geosphere Crust Mantle Convection Current Inner Core Outer Core Asthenosphere Lithosphere	Lithospheric Plates or Tectonic plates -Oceanic plates -Continental plates Divergent boundary -Seafloor spreading Convergent boundary -Subduction Transform boundary **History of Tectonic Plates:** Pangaea Continental Drift	Subsurface Topography Continental shelf Continental slope Trench Abyssal plain Guyot Seamount Mid-ocean Ridge Rift Valley Volcano	Magma Lava Ring of Fire Hot Spot Geothermal Energy Igneous Rock	Richter scale Seismic waves Focus Epicenter Frequency Landslide Mass wasting Gravity Tsunami

Year-Long Anchoring Phenomena: (LEARNING PROCESS)
Earth is the only planet in our solar system that can support life.

Unit Phenomena (LEARNING PROCESS)
Impossible Trailer - https://www.youtube.com/watch?v=Bgw394ZKsis
Trailer about the 2004 Indian Ocean earthquake and tsunami and a family's struggle to survive. Follow up with I notice/wonder or observations/inquiries.
Why do we see major geologic events in the Ring of Fire?

Possible Preconceptions/Misconceptions: (REFLECTION – PRIOR TO TEACHING THE UNIT)
You can travel to the center of the earth.
Mountains, valleys, and all landforms have always been there and don't change.
Everywhere on earth experiences earthquakes.
The continents were never joined together.
The ocean floor is flat.
The floor of the ocean is only cold.

Key concept	Related concept(s)	Global context
Change (MYP/CCC) 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; 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.
Why do we see major geologic events in the Ring of Fire?

Inquiry questions

Factual—

What do fossils show scientists?
What landforms are on the ocean floor?
Why does the Earth have layers?

Conceptual—

How do the layers of the earth compare?
How do plate movements change the shape of Earth's surface?

Debatable-

Would you prefer to live near a volcano or a fault line?

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 A: Knowing and Understanding **MYP B: Inquiring and Designing**	MYP A: Unit 2 Exam- Paper 1 MYP B- Plate Tectonics Edible Lab	**Mid- Unit Assessment(s):** -Earth's Layers and Plate Tectonics **Summative Assessment(s):** Paper 1 (Common Multiple Choice Assessment) Paper 2 (Student-Choice Short Answer Assessment)

Approaches to Learning (ATL)

Category(s): Thinking, Research, and Collaboration
Skill Indicator: Use models and simulations to explore complex systems and issues. Gather and organize relevant information to formulate an argument. Working effectively with others.

Learning Experiences

Add additional rows below as needed.

Objective or Content	Learning Experiences	Personalized Learning and Differentiation
a. Ask questions to compare and contrast the Earth's crust, mantle, inner and outer core, including temperature, density, thickness, and composition.	Labaids 1—Storing Nuclear Waste—Students read about nuclear waste: what it is, how it affects people, and how it should be stored safely. They review maps that show population density by county and the locations of operating nuclear reactors in the contiguous United States and consider the social concerns related to choosing a central location to store the country's nuclear waste. Students use what they learn from the reading and their map analysis to identify the risks and challenges in selecting a long-term storage site for nuclear waste.	• Lab-Aids Experiences • Capstone Connections • Discovery Education High School Environmental Science Techbook • Extensions – Enrichment Tasks/Projects • NGSS Case Study 7: Gifted and Talented Students • Next Generation Science Standards: "All Standards, All Students"
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.	LabAids 12- The Continent Puzzle- Students use a World Puzzle that has both rock and fossil evidence, as well as the shapes of the continents. They work to rearrange the landmasses so the shapes fit together and the pieces of evidence line up. They theorize that the position of the continents has changed over time. They compare their World Puzzle to three past landmass arrangements and recognize that their puzzle matches Pangea.	
f. Construct an explanation of how the movement of lithospheric plates, called plate tectonics, can cause major geologic events such as earthquakes and volcanic eruptions. (Clarification statement: Include convergent, divergent, and transform boundaries.)	LabAids 10- Plate Boundaries- Students use a simulation to investigate what happens at plate boundaries, where plates either move apart, move toward each other, or move past each other. Students investigate the rate of changes on Earth due to plate motion as the simulation models different time periods, from 10 years to 20 million years. Students compare the similarities and differences in the geological processes that occur at three types of plate boundaries.	

Content Resources

GaDOE Earth's Changing Landscape Instructional Segment, Discovery Education Grade 6 Science Techbook, Discovery Education High School Environmental Science Techbook, Lab Aids: Geological Processes, BrainPOP, Edpuzzle

Capstone Connections

Students are working through the Capstone Project. They should have a topic selected and working through parts A-D.