Marietta City Schools

District Unit Planner

Grade 5 Science

Theme	*Unit 1 Earth and Changes Over Time*	**Unit duration**	*8 weeks*

Mastering Content and Skills through INQUIRY (Establishing the purpose of the Unit): *What will students learn?*

GaDoE Standards/3D Science Elements

Georgia Standards:
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, 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.
(Clarification statement: Examples could include seismological studies, flood forecasting (GIS maps), engineering/construction methods and materials, and infrared/satellite imagery.)

Unit Objectives:
Students will develop their understanding of how constructive and destructive forces shape Earth's surface features.
Students will understand how technology can be used to limit and predict the impact of constructive and destructive forces.

Unit Phenomena: **Unit Phenomena:**
Why doesn't the surface of the Earth look the same no matter where you go? Topographical Map of Earth's Surface Features
Additional Phenomena
Formation of Providence Canyon – Photo and guiding questions.
Earthquakes Over 15 Years - A time lapse video showing a world map with 15 years of earthquakes. A great way to show the ring of fire.

Page Keeley Probes:
Page Keeley probes can be used as phenomena. They are intended to elicit student understanding about science concepts. Starting a unit or lesson with a probe will help you uncover misconceptions and see what students already know about a topic. Using a probe at the beginning of a lesson and then at the end of the lesson serve the

purposes of pretesting and then formatively evaluating student thinking. **Below is a list of probes from Page Keeley's book Uncovering Student Ideas in Primary Science, that are appropriate for this unit.** This book has been purchased for your grade level by the Office of Academic Achievement and can be found in your media center.
Beach Sand (Volume 1)
Mountain Age (Volume 1)
Is it a Rock? (Volume 2)

Science & Engineering Practices:	**Disciplinary Core Ideas:**	**Crosscutting Concepts:**
• Asking questions and defining problems • Developing and using models • Engaging in argument from evidence • Use mathematics and computational thinking	• Geological Processes • Formation and/or destruction of landforms	• Structure and Function • Cause and Effect • Systems and system models

Misconceptions:
Students may think that all constructive forces are good, since they add land to the surface of the Earth. Although this may be seen as a positive action, consider sharing that volcanoes cause the addition of landmass but may damage existing terrain.
Students may think that all destructive forces are bad since destructive forces break down land. This may be interpreted as a negative outcome. However, weathering and erosion help form major land structures and allow water to flow to different areas.
Students may think that change to landforms is a slow process. In fact, changes to landforms can occur both slowly and quickly.
Students should understand that weathering and erosion are not the same. Weathering breaks down rocks to create sediment and erosion moves the sediments away.
Rocks are permanent. Constructive and destructive forces affect all materials on the surface of the earth. Rocks, metals, concrete, and other related structures are impacted by weathering and erosion.
Need more help understanding the differences? This website offers great examples to help you learn more about constructive and destructive forces.

Math/ELA Connections/STEM Connections
ELAGSE5RI1 Quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text.
ELAGSE5RI2 Determine two or more main ideas of a text and explain how they are supported by key details; summarize the text.
ELAGSE5W2 Write informative/explanatory texts to examine a topic and convey ideas and information clearly.
a. Introduce a topic clearly, provide a general observation and focus, and group related information logically; include formatting (e.g., headings), illustrations, and multimedia when useful to aid comprehension.
b. Develop the topic with facts, definitions, concrete details, quotations, or other information and examples related to the topic.

MATH:
Construct viable arguments and critique the reasoning of others.
In fifth grade, students may construct arguments using concrete referents, such as objects, pictures, and drawings.
They explain calculations based upon models and properties of operations and rules that generate patterns. They demonstrate and explain the relationship between volume and multiplication. They refine their mathematical communication skills as they participate in mathematical discussions involving questions like "How did you get that?" and "Why is that true?" They explain their thinking to others and respond to others' thinking.

Model with mathematics.
Students experiment with representing problem situations in multiple ways including numbers, words (mathematical language), drawing pictures, using objects, making a chart, list, or graph, creating equations, etc. Students need opportunities to connect the different representations and explain the connections. They should be able to use all of these representations as needed. Fifth graders should evaluate their results in the context of the situation and whether the results make sense. They also evaluate the utility of models to determine which models are most useful and efficient to solve problems.

STEM
Erosion on Rivers - Students learn about water erosion through an experimental process in which small-scale buildings are placed along a simulated riverbank to experience a range of flooding conditions. They learn how soil conditions are important to the stability or failure of civil engineering projects and how a river's turns and bends (curvature, sinuosity) make a difference in the likelihood of erosion. They make model buildings either with a 3D printer or with LEGO® pieces and then see how their designs and riverbank placements are impacted by slow (laminar) and fast (turbulent) water flow over the soil. Students make predictions, observations and conclusions about the stability of their model houses and develop ideas for how to mitigate damage in civil engineering projects.

Teach Engineering Earthquake Engineering Design Challenge

Discovery Education Science Techbook (Log into your DE account using your Google credentials before accessing the DE resources) You will find station rotation activities such as leveled reading passages, interactives, hands-on labs, virtual labs, video clips, and more on the Explore page of each Techbook unit.
Formation of Landforms Volcanoes
Erosions and Deposition Glaciers
Waters on the Earth Landforms Earthquakes

Discovery Education Hands-on Activities
Erosion - Here Today, Gone Tomorrow
Hands-On Activity: Sand Shifters
Hands-On Activity: Canyon Model
Hands-On Activity: Modeling Atmosphere and Geosphere Interactions
Hands-On Activity: Cake Batter Lava
Erosion and Deposition Volcanoes

Essential Questions

Factual—

Explain the difference between constructive and destructive processes; provide four examples of each.

How do scientists monitor seismic activity?

Explain how organisms are impacted by the changing landscape.

What is the Ring of Fire?

Inferential—

How is technology used to limit and/or predict the impact of constructive and destructive processes?

How do natural processes work together to continually shape the surface of Earth through constructive and destructive forces?

Will Stone Mountain always exist? Why or Why not?

Critical Thinking-

Construct an argument supported by scientific evidence to identify surface features as being caused by constructive and/or destructive processes.

How do human activities contribute to erosion?

Is erosion beneficial or harmful? Explain why.

Tier II Words- High Frequency Multiple Meaning	**Tier III Words-** Subject/ Content Related Words
Earth, runoff, pond, volcano, earthquakes	weathering, erosion, deposition, delta, tectonic plates, fault, trenches, glaciers, valleys, canyons, ridges, magma, landforms, tsunamis, waves, flood, seismic wave, seismograph, constructive forces, destructive forces, beach reclamation, levees, retention ponds

Assessments

Unit Summative Assessments are accessible through Schoology and use the Performance Matters assessment platform.

Teacher Resources These resources are intended to support teachers with background information and planning for instruction.
The following Knowledge-Based Unit contains instructional read alouds designed to build knowledge around concepts associated with this planner. Highlighted lessons provide direct text-based support for the expectations of the associated SS or Sci standards and could be used to deepen student understanding/application of those standards. The remaining lessons build similar knowledge but do not directly relate to the content standards. **15-Day Plan: Earth and Changes Over Time** **GaDOE Inspire Science 5th Grade: Earth and Changes Over Time**

Objective or Content	Learning Experiences	Differentiation Considerations
CLE 1-3: S5E1. Obtain, evaluate, and communicate information to identify surface features on the Earth caused by constructive and/or destructive processes.	Earth's Processes Discovered through Providence Canyon State Park This segment focuses on Earth's processes associated with Providence Canyon State Park, Georgia and other North American landmarks.	Student Choice Performance Tasks Reflection and Goal Setting Learning Stations Choice Boards Formative Probes Science Journaling Multi-sensory activities Assistive Technology Flexible Grouping Multiple Means of Representation

Recommended High Quality Complex Text By Lexile Band
Shakes and Quakes by Baby Professor *Landforms of Georgia* by Harcourt School Publishers *Even the Biggest Continents Move!* By Baby Professor *How Do Landforms Change*? By Harcourt School Publishers *How Geologists Read the Geologic Time Scale* by Baby Professor

Earth Changes by Benchmark Education

Nature Records Earth's History by Baby Professor

Resources and Their Impact by Benchmark Education

Everything Earthquakes and Tsunamis by Baby Professor