

## STEAM Unit Planner

Unit Title: Environmental Erosion

Grade: 3rd

Duration: 5 weeks (completed by Nov. 1st)

Driving Question/Problem/Phenomenon:

**Driving Question:**

How can we prevent the damage caused by weathering and erosion at MCAA?

- How do we identify the environmental impact and solve the problem with the drainage near the gardens and science lab building?
- How can we make improvements to the playground to the drainage solution that 3rd graders designed in 2019?

**Problem:** Erosion and Weathering and how it creates a change in the environment. Environmental impact.

**Phenomenon:** Video of the playground drainage during storm (Nancy’s Video)/Providence Canyon (Georgia)

### Focus Standards

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.

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.

Connection to American Indians: how did they use rocks and soils, what types of rocks did they use [https://www.msnuceus.org/membership/html/k-6/rc/rocks/4/rcr4\\_3a.html](https://www.msnuceus.org/membership/html/k-6/rc/rocks/4/rcr4_3a.html); Etowah Indian Mounds (the mounds themselves and river)

### Integration Across Content

<b>Math</b>	Standards for Mathematical Practice 5 Use appropriate tools strategically.  MGSE3.MD.4 Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units— whole numbers, halves, or quarters
<b>ELA</b>	ELAGSE3RI4: Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a grade 3 topic or subject area. ELAGSE3W7: Conduct short research projects that build knowledge about a topic. ELAGSE3W8: Recall information from experience or gather information from print and digital sources; take brief notes on sources and sort evidence into provided categories.
<b>Arts</b>	

<b>Launch</b>	Students explore school grounds by walking around and observing the environment and discussion of the playground locations.							
<b>Unit Summary</b>	Effects of wind and water on the environment							
<b>Real World Connections</b>	MCAA playground The uses of rocks today							
<b>Vocabulary Acquisition</b>	<table border="1"> <thead> <tr> <th>Content Vocab</th> <th>Arts Vocab</th> </tr> </thead> <tbody> <tr> <td>evidence, research, expert, anticipate, design</td> <td></td> </tr> <tr> <td colspan="2" style="text-align: center;"><a href="#">Activity</a></td> </tr> </tbody> </table>		Content Vocab	Arts Vocab	evidence, research, expert, anticipate, design		<a href="#">Activity</a>	
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<b>Hands-on Activities to Support the Driving Question/ Problem/Phenomenon</b>	Soil Kits Evaluation of playground erosion. Soil testing. What types of soil exist and how to replace the soil and prevent further erosion.							
<b>Specialists Integration</b> <i>Art, Music, Tech, PE</i>								
<b>Experts/Community Partnerships/Related Field Trips</b>	Chattahoochee Nature Center (field trip) Geologist Vulcan Rock Quarry professional Oasis Landscapes and Irrigation (help with making prototypes a reality) Cobb County Water System (discuss how water drains and why) Erosion Specialists							
<b>Possible Products</b>	Soil Kits Comparison of rock uses now and then (connection to American Indians) Make a necklace Replica of prototype to prevent playground erosion using the stream tables							
<b>Teacher and Student Self-Reflection</b>	Teacher Self-Reflection	*make a copy of the teacher reflection form from the Templates folder to link here*						
	Student Self-Reflection	I exhibited (Creativity, Communication, Collaboration, Critical-Thinking) when.... The most important thing I learned in this project is... I wish I had spent more time on ... <b>OR</b> One thing I wish I had done differently is...						
<b>Materials</b> <i>Provide a list of</i>	STEAM Journal Stream Tables							

<i>materials needed for donation to Dr. Patterson 2-3 weeks prior to the unit starting</i>	Soil Kit materials* Different types of actual rocks Different types of soils (sand, clay, silt, loam) Landscape materials (small)
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### Project Timeline/Checkpoints

Date/Week	Tasks for Teachers	Tasks for Students
September 30-Oct. 4	<ul style="list-style-type: none"> <li>• Launch/Present Driving Question/Phenomena</li> <li>• Get background links available for kids on Google Classroom;</li> <li>• Create design brief and portfolio;</li> <li>• Get photos of irrigation/ solutions/ retaining walls; failures and successes;</li> <li>• Create a Template of Google slide show for EDP;</li> <li>• Place students into groups;</li> <li>• Create bulletin board sheets of Engineering Design Process</li> </ul>	<ul style="list-style-type: none"> <li>• Ask and Research steps</li> <li>• Outdoor walk (observation and research of playground environment)- write down observations of playground environment in STEAM Journals</li> <li>• add to the Engineering Design Process bulletin board sheets</li> </ul>
Oct. 7-11	<ul style="list-style-type: none"> <li>• CNC field trip Oct. 7;</li> <li>• Compile materials for prototype (week of Oct. 21)</li> <li>• Find a specialist to speak to the kids about irrigation(Oasis Landscape and Irrigation)</li> </ul>	<ul style="list-style-type: none"> <li>• CNC Observations and continue research</li> <li>• Begin Google Slides of Engineering Design Process (one slide per step) - Ask and Research slides</li> <li>• Continue to add to the Engineering Design Process bulletin board sheets</li> </ul>
Oct 14-18	<ul style="list-style-type: none"> <li>• Conference Week</li> <li>• Demonstrate the use of the Stream Tables</li> </ul>	<ul style="list-style-type: none"> <li>• Imagine step in Google Slides of EDP</li> <li>• Teacher will present how to use the STREAM table</li> <li>• Students will explore STREAM table</li> <li>• add to the Engineering Design Process bulletin board sheets</li> </ul>
Oct. 21-25	<ul style="list-style-type: none"> <li>• Create a rubric for prototype;</li> <li>• Create a folder of images on drive;</li> <li>• Create QR code for Google Slideshow presentation</li> </ul>	<ul style="list-style-type: none"> <li>• Plan and create step in Google Slides of EDP</li> <li>• Students will begin building prototypes</li> <li>• Students and/or teacher will take pictures to insert into Slideshow</li> <li>• add to the Engineering Design Process bulletin board sheets</li> </ul>
Oct. 28-Nov. 1	<ul style="list-style-type: none"> <li>• Facilitation of prototype development</li> </ul>	<ul style="list-style-type: none"> <li>• Completion of prototype</li> <li>• Students will work on Improve step and add to Google Slides of EDP</li> <li>• add to the Engineering Design Process</li> </ul>

		bulletin board sheets
Nov. 4-6	<ul style="list-style-type: none"> <li>• Prepare for presentation for exhibit night on Nov. 6</li> </ul>	<ul style="list-style-type: none"> <li>• Students will complete a peer evaluation if time permits (after ?)</li> </ul>

**IMPROVEMENTS:**

- \*Have an additional expert come and speak with students - Expert that owns a farm
- \*Introduction to expert/students should have questions before they come
- \*Allow experts to provide feedback to student projects separate from their presentation
- \*Maybe show a way to connect it globally instead of just locally.
- \*Display copies of each groups' plans on wall display.
- \*Go back to ASK at the end of challenge.
- \*Add images of teacher demonstrating the Stream table
- \*Add images of the "Create" process as students work on building
- \*Complete Research outside the local environment
- \*Student reflection after the challenge is completed

**Reflecting on the Unit**

How well did this unit support student exploration of the problem/driving question?
How could you improve or adapt the unit to promote a deeper level of student exploration and engagement?
Teacher Notes