The following instructional plan is part of a GaDOE collection of Unit Frameworks, Performance Tasks, examples of Student Work, and Teacher Commentary. Many more GaDOE approved instructional plans are available by using the Search Standards feature located on GeorgiaStandards.Org.

Georgia Performance Standards Framework for Earth Science – Grade 6

Unit: Rocks & Minerals
General Task
Rock Cycle Drama

Standards (Content and Characteristics):

S6E5. Students will investigate the scientific view of how the earth’s surface is formed.

d. Describe processes that change rocks and the surface of the earth.

S6CS5. Students will use the ideas of system model, change and scale in exploring scientific and technological matters.

b. Identify several different models (such as physical replicas, pictures, and analogies) that could be used to represent the same thing, and evaluate their usefulness, taking into account such things as the model’s purpose and complexity.

S6CS10. Students will enhance reading in all curriculum areas by:

a. Reading in All Curriculum Areas
   - Read a minimum of 25 grade-level appropriate books per year from a variety of subject disciplines and participate in discussions related to curricular learning in all areas
   - Read both informational and fictional texts in a variety of genres and modes of discourse
   - Read technical texts related to various subject areas

c. Building vocabulary knowledge
   - Demonstrate an understanding of contextual vocabulary in various subjects.
   - Use content vocabulary in writing and speaking.
   - Explore understanding of new words found in subject area texts.

d. Establishing context
   - Explore life experiences related to subject area content.
   - Discuss in both writing and speaking how certain words are subject area related.
   - Determine strategies for finding content and contextual meaning for unknown words.
Enduring Understanding:
Rocks at the Earth’s surface weather, forming sediments that are buried, then compacted, heated, and often recrystallized into new rock.

Essential Question:
Is the rock cycle really a cycle? Explain your answer.

ADMINISTRATION PROCEDURES

Pre-Assessment: The teacher will use a “chalk talk” activity to assess students’ prior knowledge of the rock cycle. Depending on the size of the class, two or three large pieces of chart paper should be posted around the room with the term “rock cycle” written in the center. Students take turns individually going to a chart and writing a descriptor/descriptors of what they already know about the rock cycle. The teacher will later be able to analyze what specific ideas about the rock cycle students may or may not have mastered to plan further instructional activities.

<table>
<thead>
<tr>
<th>Outcome / Performance Expectations:</th>
<th>Students will investigate the scientific view of how the earth’s surface is formed by describing the processes that change rocks and the surface of the earth.</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Teacher Instructions:</td>
<td>Teacher Role:</td>
</tr>
<tr>
<td></td>
<td>Begin this lesson by reviewing how igneous (volcanic), metamorphic, and sedimentary (layered) rocks form. Ask the students if they think that once a rock forms, it always stays the same (recall the process of erosion). Review the rock cycle using the attached graphic organizer to help students identify the processes that cause rocks to change. Discuss the types of Earth forces that can change igneous and sedimentary rocks such as lateral plate movement, convergent plate movement and divergent plate movement.</td>
</tr>
<tr>
<td></td>
<td>Student Role:</td>
</tr>
<tr>
<td></td>
<td>Students will enact a dramatization of the rock cycle. Roles will be assigned and the teacher will narrate a story as the action unfolds and will provide cues as needed. The classroom will be divided into layers of the Earth:</td>
</tr>
</tbody>
</table>
Georgia Performance Standards Framework for Earth Science – Grade 6

- The outside of the circle will be the crust.
- The second and third rows will be the upper and lower mantle.
- The center of the circle will be the core.

Begin the activity by assigning the roles to be played and providing labels for the students wear. As you assign a role, have each group practice and perfect their action. Most of the action will be played by groups of students while seated at their desks. Begin by assigning these stationary group roles:

**Crust**

- Group #1: 4 or 5 students. This group will stand in a row at the front of the row holding hands to form the surface of the crust (toward the end of the drama, the "magma" will run up and try to "burst" through this crust)
- Group #2: 4 or 5 students. This group will blow or make sounds like the wind to model weathering by the wind.
- Group #3: 4 or 5 students. This group will stay in their desk and will make the sound of rain by drumming their fingertips on their desks to model weathering by water.
- Group #4: 4 or 5 students. This group will stay in their desk and will be stacking hand over hand and then pressing down to model the layering of sediments and compaction into rock

**Upper Mantle**

- Group #5: 4 or 5 students. This group will sit in their desks in the center of the room. They will be rattling their desks to simulate an earthquake

**Mantle**

- Group #6: 4 or 5 students. This group will be placed at the back of the room. Four students will stand up and hold hands to form a circle, or...
magma chamber. They will rotate around, step into the middle of the circle and back out to stimulate melting. They will move their arms up and down as they move to simulate the convection currents.

1. Assign the movement roles as follows:

   - **Rock:** The cycle begins as groups 2 & 3 (the wind and rain) begin to make sounds. These forces create weathering conditions and weaken the rock in the crust.
   - As weathering occurs, two chosen students from the crust will break from the interlocked arms of fellow crust members and start the cycle and fall down to the river.
   - **River:** The river will join hands with the 2 students playing the rock, and run around the room (carry the sediments), dropping them off at Group #4 (the sediment layers group).
   - **Layers** The layers group will form a tower of rock layers on their desks, using their hands. One by one each student will place down their right hands, one on top of another, then the their left hands to simulate the layers. The students should stay in this position until the earthquake!
   - **Plate Mover:** The plate mover will choose a plate movement card. The 3 possible cards show the 3 different types of plate movement: lateral (side by side), convergent (coming together), or divergent (moving apart). The card chosen will indicate what type of action will take place next. Group #5 rattles their desks in an earthquake when the card is chosen.

2. The next move will depend on the card that was chosen:

   - **Lateral plate movement:** This type of movement causes intense heat and pressure, resulting in an earthquake. Group #5 should rattle their desks. The rock students now change from sedimentary...
3. The next move will depend on the card that was chosen:

- **Lateral plate movement:** This type of movement causes intense heat and pressure, resulting in an earthquake. Group #5 should slide their desks to model lateral movement. The teacher will explain to students that this type of movement could possibly form metamorphic rock. The “rock students” now change from sedimentary to metamorphic by twisting their arms around their body.

- **Convergent plate movement:** This type of movement causes the folding of rock and mountain building. Group #5 should rattle their desks. Students playing the rock will walk back up to join the crust (Group #1). Together with Group #1, the rock students will raise their arms up in the shape of a mountain chain to demonstrate how the rock has been forced upward to form mountains.

- **Divergent plate movement:** This type of movement pulls the plates away from one another, causing our rocks to tumble down into the magma chamber. Group #5 should rattle their desks. Students playing the rock will fall down into the magma chamber and begin melting.
4. Rehearse each part before beginning. When ready, the teacher should read the following "Rock Cycle Drama", a story of a rock's journey through the rock cycle (adapted from www.caosclub.org/totalcaos/members/caosho2.html-19k)

<table>
<thead>
<tr>
<th>Narration</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long ago, in the history of the earth, there was a rock resting high upon a mountain top. This rock formed the peak of the magnificent mountain. Egotistically, the rock thought, &quot;I am the highest and mightiest rock of them all. No rock is higher, mightier or more important than I.&quot;</td>
<td>Two students playing the rock stand proudly at the front of the class holding hands with Group #1. Arms are held up in the form of a mountain chain.</td>
</tr>
<tr>
<td>The wind blew viciously on that mountaintop.</td>
<td>Group #2 performs.</td>
</tr>
<tr>
<td>Cold rains fell hard upon the rock. But the rock was strong, and withstood the weather for many years.</td>
<td>Group #3 performs.</td>
</tr>
<tr>
<td>Gradually, however, the rock began to weaken...</td>
<td>Pause allowing the &quot;rock&quot; to go between Groups #2 and #3. With each stop, the sounds of wind and rain are heard.</td>
</tr>
<tr>
<td>The pelting rain and bitter cold wind buffeted the rock until it</td>
<td>The &quot;rock&quot; breaks apart; two students</td>
</tr>
</tbody>
</table>
slowly began to crumble.  

| break free from one another becoming sediments.  

A stream that was carrying the rain down the mountain picked up the pieces of rock. This sediment was carried a long way by the stream which eventually became a river as it rushed down the mighty mountain.  

| Student playing the "river" holds hands with the 2 "sediments" and runs around the room, finally stopping at Group #4.  

After rushing downriver for hundreds, maybe thousands, of miles, the sediments were cast aside at the mouth of the river and piled themselves on top of the other sediments that were also deposited there by the river.  

| Students playing the sediments lay hand-over-hand on the desk along with members of Group #4. When all the hands are piled, the top hand should press down on the rest.  

The weight of the layers above caused the sediments to be compacted together, until a new kind of rock was formed. What shall we call this new mighty rock?  

| All say together, "Sedimentary!" The students playing the rock once again join arms, demonstrating that a new rock has been formed.  

The new rock was pleased with its structure, all beautifully layered and composed of many colors. "I am the most beautiful rock in the world!", bragged the rock. "I am under water where no wind or rain can wear at me! I will not erode away!" But as the rock spoke, a tremendous roar was heard, and the rock began to shake.  

| Group #5 rattles their desks yelling, "Earthquake!" Rock once again breaks apart.  

The shaking continued and the  

| At this point, the story
### Georgia Performance Standards Framework for Earth Science – Grade 6

<table>
<thead>
<tr>
<th>rock separated from the rocks around it, crumbling into pieces, and crying, &quot;No, not me!&quot;</th>
<th>can continue in 3 different ways. The Plate Mover will choose a card to indicate the next action.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Divergent movement:</strong></td>
<td></td>
</tr>
<tr>
<td>The rock was now deep inside the Earth, and was no longer a solid rock. It melted into a molten rock, called magma. The rock desperately wished to be back on the crust where the cool wind blew!</td>
<td></td>
</tr>
<tr>
<td>The magma boiled and mixed with steam inside the magma chamber.</td>
<td>Pause as the magma is “mixed”; Students forming Magma Chamber circle around the rock, and the student representing the steam enters the chamber</td>
</tr>
<tr>
<td>The magma became so hot it began pushing and forcing its way out of the chamber, and rising up toward the crust.</td>
<td>Students in the magma chamber run up to the front of the room, one at a time, and try to break through the crust, erupting out of a volcano on the hands of the students forming the surface.</td>
</tr>
<tr>
<td>Some of the magma burst through the crust. Some did not break through, and cooled slowly beneath the surface. These slow</td>
<td>All yell, &quot;Igneous!&quot;</td>
</tr>
</tbody>
</table>
### Georgia Performance Standards Framework for Earth Science – Grade 6

<table>
<thead>
<tr>
<th>Rock Formation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cooling Rocks</td>
<td>Rocks grew beautiful crystals inside their structure and formed new crust. The rocks that erupted also cooled and hardened into black, glassy volcanic rocks. What shall we call these mighty rocks?</td>
</tr>
<tr>
<td>Volcanic Rocks</td>
<td>&quot;I am the shiniest rock of all! I will shine forever!&quot; But as the rock spoke, the wind began to blow... THE END</td>
</tr>
<tr>
<td>Lateral Movement</td>
<td>Students playing the rock will wrap their arms around themselves, twisting themselves into a new form.</td>
</tr>
<tr>
<td>Convergent Movement</td>
<td>All yell, &quot;Metamorphic!&quot; Rock waits there, and Plate Mover makes another motion with their hands. THE END</td>
</tr>
<tr>
<td>Convergent Movement</td>
<td>The rock will run up to join the crust (Group #1). Raise arms up to form a new mountain chain. THE END</td>
</tr>
</tbody>
</table>
Georgia Performance Standards Framework for Earth Science – Grade 6

Materials Needed:
- Standard student desks
- Classroom space
- Copy of “Rock Cycle Drama”
- Graphic organizer
- Student journals
- Labels/placards for students

Safety Precautions:
Unnecessary furniture should be moved away from the center of the classroom to allow for adequate movement during the activity.

Task with Student Directions:
See student actions in the general teacher instruction section of this task.

Materials:
The 3 index cards showing the 3 different types of plate movement: lateral (side by side), convergent (coming together), or divergent (moving apart) are one of the resources needed for this activity. The card chosen will indicate what type of action will take place next in the next part of the activity. The other resource will be a copy of the “Rock Cycle Drama” narrated by the teacher during the activity.

Additional resources may include access to internet information for gifted students to do independent study and/or research.

Resources:
www.caosclub.org/totalcaos/members/caosho2.html-19k

Homework / Extension:
As an extension of this lesson, have students look back on this activity to write a short narrative for their journal about the rock cycle, covering the three types of rocks and at least one way that each can be formed.

Students should also answer the essential question in their journal entry and explain their answer.

Instructional Task Accommodations for ELL Students:
- Read the story orally/explain the drama activity to ELL students prior to using this activity in class; this accommodation can be done through the use of various type of electronic devices
- Pair verbal directions with verbal cues
- Provide a written outline of the story activity for students to use as the drama proceeds
- When reviewing information about the processes causing the formation of different types of rocks, provide
<table>
<thead>
<tr>
<th>Instructional Task Accommodations for Students with Specific Disabilities:</th>
<th>Instructional Task Accommodations for Gifted Students:</th>
</tr>
</thead>
</table>
| • Provide adequate “wait time” to complete the graphic organizer  
• Provide difficult terminology used in graphic organizer in form of a word bank or list | • Provide a written copy of the “Rock Cycle Drama” along with the oral presentation during the activity for students with ADHD, OHI, or processing deficits  
• Reduce length of narrative required for journal entry in extension activity  
• Have students repeat verbal instructions back to adult/peer  
• About the particular part they are acting out in the drama  
• Provide tactile symbols of the terms used in graphic organizer for visually impaired students  
• Provide task analysis listing each acting group/role in the drama to reduce possible confusion for students with organizational difficulties | • Curriculum compacting techniques  
• Negotiate learning contract for independent project about rock cycle  
• Implement two center activities from which students can choose to do instead of the whole group drama on the rock cycle  
• Use multiple text and supplemental materials when developing center activities  
• Alternative activities oriented to individual intelligence profiles through chunking |
Georgia Performance Standards Framework for Earth Science – Grade 6

ROCK Processes:

IGNEOUS

Forms when magma

&

SEDIMENTARY

Forms when sediments are

METAMORPHIC

Forms when texture & composition is changed