Georgia Performance Standards Framework for Earth Science – Grade 6

Unit: Rocks and Minerals
Inquiry Task
How do Scientists Classify Rocks?

Standards (Content and Characteristics):
S6E5. Students will investigate the scientific view of how the earth’s surface is formed.
   c. Classify rocks by their process of formation.

S6CS1. Students will explore the importance of curiosity, honesty, openness, and skepticism in science and will exhibit these traits in their own efforts to understand how the world works.
   a. Understand the importance of—and keep—honest, clear, and accurate records in science.
   b. Understand that hypotheses are valuable if they lead to fruitful investigations, even if the hypotheses turn out not to be completely accurate descriptions.

S6CS2. Students will use standard safety practices for all classroom laboratory and field investigations.
   a. Follow correct procedures for use of scientific apparatus.
   b. Demonstrate appropriate techniques in all laboratory situations.
   c. Follow correct protocol for identifying and reporting safety problems and violations.

S6CS6. Students will communicate scientific ideas and activities clearly.
   a. Write clear, step-by-step instructions for conducting scientific investigations, operating a piece of equipment, or following a procedure.
   b. Understand and describe how writing for scientific purposes is different than writing for literary purposes.
   c. Organize scientific information using appropriate tables, charts, and graphs, and identify relationships they reveal.

S6CS9. Students will investigate the features of the process of scientific inquiry.
   Students will apply the following to inquiry learning practices:
   a. Scientific investigations are conducted for different reasons. They usually involve collecting evidence, reasoning, devising hypotheses, and formulating explanations.
   b. Scientists often collaborate to design research. To prevent bias, scientists conduct independent studies of the same questions.
   c. Accurate record keeping, data sharing, and replication of results are essential for maintaining an investigator’s credibility with other scientists and society.
   d. Scientists use technology and mathematics to enhance the process of scientific inquiry.
S6CS10. Students will enhance reading in all curriculum areas by:
a. Reading in All Curriculum Areas
c. Building vocabulary knowledge
d. Establishing context

Enduring Understanding:
Rocks are classified based on how they formed and their mineral composition

Essential Question(s):
How are rocks classified?

Pre-Assessment:
Discuss with students what they already “know” or think they know “prior knowledge” to help address the question. List these things or ideas on the board or chart paper for future reference.

Outcome/ Performance Expectations | Identify the learning goals for this inquiry-based task. Students will be able to distinguish the three rock types based on their texture and compositions. Students will be able to develop a classification scheme for igneous, metamorphic, and sedimentary rocks.

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**Write a concept statement…How would you formulate an expert idea?** | List examples of how students may incorporate their ideas into experiments. The three major rock types are distinguishable by texture and composition. Scientists classify rocks based on established criteria of texture and composition.

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**Write a concept statement / question…What kind of situation would cause this concept to become apparent in students’ understanding?** | Write questions or statements to assist students develop and explain their ideas (i.e. aid in conceptualizing their knowledge-making exploration). Teacher may provide a “mystery box” containing fruits with different textures. Students feel what’s inside the mystery box and guess which fruit/nut is contained in the box. This introduces the concept of texture and the use of our senses to distinguish texture. As a preview for classification, have students classify the types of shoes that are being worn in the classroom that particular day (i.e. boots, sandals, slip-ons, lace-ups, etc.). Alternatively, teacher provides pictures of three rock types and asks students to compare and contrast what they see. These introductory activities prepare students for the rock “groupings” they will later make to create a classification system. Teacher tells students that scientist classify rocks by the different features they have. Students make observations and gather data that would help them create their own classification scheme for rocks.

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**Identify necessary data and observations…What data would demonstrate the mastery of the concept by ALL students in the classroom?** | Identify relevant observations and data collected by students to aid in conceptualizing their knowledge-making exploration. In addition, lists misconceptions that arise and may prohibit students internalizing their own understandings, and what steps should a teacher take to overcome these misconceptions?

Students are provided with a collection of rock samples representative of the three rock types. Students create their own classification scheme for rock types. Teacher asks them to compare to established schemes. Teacher follows up with a lesson about the classification of rock types.

### Write procedures that will cause students to organize data… *Test a procedure using known concepts.*

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<thead>
<tr>
<th></th>
<th>List sample procedural statements that students may use to organize their data.</th>
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</table>
2. Students decide how to group rock samples.  
3. Students describe the characteristics of each grouping.  
4. Students create a table of characteristics.  
5. Students conclude which characteristics are best suited for rock groupings. |

### Write questions or activities to use or apply the concept (represent, model, visualize, or design new experiments).

<table>
<thead>
<tr>
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<th>Does the student classification scheme lead to a correct assignment of rock type based on students prior knowledge of processes of formation explained in the rock cycle?</th>
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</table>
|  | Application: Students test classification scheme by grouping additional unknown rock samples.  
Students compare established classification scheme to their classification scheme to clarify misconceptions, verify concept development of how rocks are classified. |

### Homework/Extension

|  | Students create a picture book or computer presentation of rock textures using digital photomicrographs or photographs. |

### Instructional Tasks

#### Accommodations for ELL Students

- Adjust teacher talk to increase comprehensibility: face students, pause frequently, paraphrase often  
- Give students more direct information to help them understand how to attack the task  
- Increase % of student talk about topic (more content related)  
- Relate content to real life  
- Provide student with outline of procedure steps

#### Accommodations for Students with Disabilities

- Offer an alternative mode of response (oral)  
- Provide peer partner  
- Give students a checklist of the questions/steps in the task to check off steps as they complete them  
- Provide sentence starters such as “The rock cycle explains …”  
- Break work into manageable parts

#### Accommodations for Gifted Students:

- Use flexible seating arrangements to allow for creativity as some students generate original ideas and higher order thinking skills  
- Invite students to explore different points of view and compare the different perspectives

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Determine where students’ interest lie on this particular topic and capitalize on this inquisitiveness.

Brainstorm with students about what types of projects they would like to explore to extend their learning beyond the classroom.

Create a “Flip book” or a multimedia presentation of the rock cycle using digital photomicrographs/photographs includes sound effects representing process of formation (explosion, igneous; crushing, metamorphic; silence, sedimentary).