Marietta City Schools
2023-2024 District Unit Planner

Third Grade

Topic Title:	*#2 Rocks, Soil, & Fossils*	**Unit Duration**	*3-4 weeks*

Mastering content and skills through KNOWLEDGE-BUILDING (establishing the purpose of the unit):

What enduring understandings will students gain from this unit? The attributes and composition of rocks and soil change over time.

GSE Standards

ELA

ELAGSE3RI1 Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers.

ELAGSE3RI2 Determine the main idea of a text; recount the key details and explain how they support the main idea.

ELAGSE3RI3 Describe the relationship between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text, using language that pertains to time, sequence, and cause/effect.

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.

ELAGSE3RI7 Use information gained from illustrations (e.g., maps, photographs) and the words in a text to demonstrate understanding of the text (e.g., where, when, why, and how key events occur).

ELAGSE3RI8 Describe the logical connection between particular sentences and paragraphs in a text (e.g., comparison, cause/effect, first/second/third in a sequence).

ELAGSE3RI9 Compare and contrast the most important points and key details presented in two texts on the same topic.

Science or Social Studies

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. (Clarification statement: Mohs scale should be studied at this level. Cleavage, streak and the classification of rocks as sedimentary, igneous, and metamorphic are studied in sixth grade.)

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. (Clarification statement: Examples could include ripples in dirt on a playground and a hole formed under gutters.)

S3E2. Obtain, evaluate, and communicate information on how fossils provide evidence of past organisms.

a. Construct an argument from observations of fossils (authentic or reproductions) to communicate how they serve as evidence of past organisms and the environments in which they lived.

b. Develop a model to describe the sequence and conditions required for an organism to become fossilized. (Clarification statement: Types of fossils (cast, mold, trace, and true) are not addressed in this standard.)

Essential Questions

Factual—

- Which type of rock is the softest? hardest?
- What components are found in a soil sample?
- How does each type of fossil form?

Inferential—

- Why were the specific rocks on the Mohs scale chosen as the benchmarks?
- What can you learn about a soil sample or rock with no tools except your own body?

Critical Thinking-

- Why are different types of rock used for construction and jewelry?
- How do differences in soil contribute to more or less farming in different Georgia regions?

Tier II Words- High Frequency Multiple Meaning	**Tier III Words-** Subject/ Content Related Words
layers, texture, organisms, beneficial, harmful, habitat, attributes	fossil, sediment, erosion, weathering, luster, microscopic, extinct,

Assessments- 3rd-5th Social Studies and Science assessments are available through AMP. Please see your instructional coach for support if needed.

Transfer of Integrated Skills:

Description: Least to Greatest

1. Provide small groups or individuals with a copy of the Rating by Traits sheet and explain the concept of arranging objects or ideas from least to greatest.
2. The activity sheet contains three lines for recording student understanding of three rankable concepts from this unit. Possible choices include hardness of minerals, luster of rocks, drainage of sediments, usefulness of soil types for farming, and age of soil horizons.
3. Students should write whatever trait they are ranking inside each arrow then label the left end with the least example, right end with the greatest example, and a midway point with an example that falls between least and greatest.

Standards**:**
ELAGSE3RI1 Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers.
ELAGSE3RI2 Determine the main idea of a text; recount the key details and explain how they support the main idea.
ELAGSE3RI3 Describe the relationship between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text, using language that pertains to time, sequence, and cause/effect.

Description: What's the Scoop on Soil? from district mini assessments

Standards**:**
ELAGSE3RI2 Determine the main idea of a text; recount the key details and explain how they support the main idea.
ELAGSE3RI3 Describe the relationship between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text, using language that pertains to time, sequence, and cause/effect.
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.
ELAGSE3RI8 Describe the logical connection between particular sentences and paragraphs in a text (e.g., comparison, cause/effect, first/second/third in a sequence).

Content-Specific GSE/Skills:

- *S3E1 Science Summative Assessment*

Writing Task and Rubric:

Description: Comparing Two Texts

1. Assign small groups two books from this unit that focus on the same topic. For example, *Rocks: Hard, Soft, Smooth, and Rough* and *Let's Go Rock Collecting*.
2. Provide students with the Thinking Dots Activity for Comparing Texts to use as preparation for writing an informational essay comparing the two texts.
3. After small groups have completed culminating graphic organizer together, provide each student with a copy of the Information Writing Checklist to consider as they plan and write.
4. Once students have completed their writing, they can use their written product as a script to record a retelling of the event using Flipgrid or other recording platform.

Score final product using the Information Writing Rubric for 3rd Grade

Standards**:**
ELAGSE3W2 Write informative/explanatory texts to examine a topic and convey ideas and information clearly.
a. Introduce a topic and group related information together; include illustrations when useful to aiding comprehension.
b. Develop the topic with facts, definitions, and details.
c. Use linking words and phrases (e.g., also, another, and, more, but) to connect ideas within categories of information.
d. Provide a concluding statement or section.
ELAGSE3RI9 Compare and contrast the most important points and key details presented in two texts on the same topic.

Objective or Content	Learning Experiences	Differentiation Considerations
Daily Lessons for Text Comprehension	*15-Day Plan: Rocks, Soil, & Fossils* ● Hook Texts: *Yucky Worms, Sylvester and the Magic Pebble, Fossil Huntress* ● Visual: *Fossil* Flocabulary, *Digging Up a Dinosaur Graveyard, Be a Rock Detective, Worms Time Lapse, Erosion* Flocabulary ● Informational: *You Can Improve the Soil* NewsELA, *How Does Erosion Happen?* NewsELA, *Rock Secrets* CommonLit, *A Rock is Lively, Earth Systems: What Are Fossils?* News ELA, *Learning from Dinosaur Fossils* ReadWorks ● Target: *How Hugh Bennett Saved America's Soil and Ended the Dust Bowl, Rocks in His Head, When Sue Found Sue*	
Connected Language Acquisition Experiences	**Picture Word Induction Model Center/ individual Activity: Moh's Hardness Scale**	
Connected Sci Experiences	***Exploration I*** In this activity, students make observations about rocks using simple equipment like a hand lens. They use their senses as a tool of observation to identify properties of rocks. They sort the rocks by shape, color, and texture. Then they classify rocks according to various characteristics, including identifying patterns.	

Materials per group:
• Rock kit of at least six rocks that can be organized into two or three groups based on physical characteristics such as color, shape, grain size, and texture
• Magnifying glass/hand lens

Materials per student:
• Safety goggles
• Writing paper, science notebook, or student activity sheet for recording ideas

Students will classify rocks according to properties including shape, color, and texture.
Divide students into groups of two to five, depending on your materials supply and the number of students.

Instruct students to put on their safety goggles. Give each group a set of at least six rock samples that can be sorted into several groups based on clearly observable physical characteristics. Make sure each rock kit contains rocks with various colors and textures. As guided inquiry, challenge students to find a way to classify or put the rocks into groups based on their own categories. For more directed inquiry, guide students in identifying characteristics they can use to classify rocks.

Communicating and Evaluating
Have students find ways to use their senses to observe the samples and look for patterns. Point out to students that they are using their senses and the hand lens as tools of observation. If students talk about the size of the rocks, guide them using leading questions to help them realize that not all rocks are the same size, even if they are the same type of rock.

Ask students to answer the following questions about each rock:
• What color is it?
• Is it shiny or dull?
• What shape is it?
• What patterns can you see?
• How does it feel? Is it smooth or rough?
• What happens when you scratch the rock?

Encourage students to ask additional questions about the rocks as they classify them. Tell each group to record the ways they sorted the rocks in their observation notebook and have them share those findings with the class. While students complete the activity, ask them questions about what they are using to classify the rocks and whether they all agree on how they are classifying

	rocks. If groups describe different points of view about classification, help students understand which characteristics can always be observed, such as texture, and which characteristics may change even with the same types of rocks, such as the size. After each group presents their findings to the class, encourage students to discuss the differences in how they classified rocks when compared to other groups. Regroup as a class to discuss some of the groups' observations. Make a list of recurring words that students used to describe the rocks, such as shiny, sand, smooth, gritty. Include descriptive words on a word wall so that students can refer to them for the duration of the lesson.	
	Exploration II In this activity, students will formulate a well-defined question. Then, they will investigate how well different soil filters out impurities from water. Materials Per group: chicken wire fine mesh wire sand clay loam (available as commercial garden soil) water food coloring coffee filters graduated cylinders short lengths of PVC tubing other materials as appropriate Per student: safety goggles gloves science notebook Instruct students to wear safety goggles and gloves during the activity. Explain that there is a risk of contracting tetanus or other bacterial or viral infections if not worn. Also, the use of goggles protects students' eyes from possible encounters with soil and wire during the activity. Divide the class up into groups of three. Have students in each group develop a well-defined question for this investigation. Give groups time to develop a hypothesis and an experiment to test their hypothesis, using the available materials; remind students to	

list the equipment and materials they will use to carry out their experiments and to clearly describe each step in their experimental procedure. Check student questions with the rubric below.

A Well-Defined Question	A Question that Needs Revision
Question contains a testable hypothesis	Question does not contain a testable hypothesis
Question can be tested in the current setting	Question cannot be tested in the current setting
Question can utilize materials on-hand	Question does not utilize materials on-hand

Then, check student procedures and allow students to carry out all reasonable experiments.

Expect some groups to place each of the different soils—sandy, clay, and loam—in different coffee filters and then to allow a measured volume of water with food coloring to pass through each soil type. Students can compare the color of the water that has passed through the soil to the color of the water that has not passed through the soil, and make qualitative measurements in this way. They can measure the volume of water passing through to make quantitative measurements. They should record their observations in a table such as the following:

Soil Type	Color of water That Passes Through Soil	Color of Water That Does Not Pass Through Soil	Volume of Water Added to Soil	Volume of Water Collected from Soil

When students are finished, have them come to a conclusion about the filtering abilities of each of the types of soil and present this conclusion, as well as their data that supports it, to the class.

Communicating & Evaluating

1. Which type of soil was best for filtering out the food coloring in the water? (Answers will vary. Expect students to provide some data to support their response.)
2. Which type of soil was best at allowing the most amount of water to pass through? (Answers will vary. Expect students to provide some data to support their response.)
3. Was there any noticeable difference in the time it took the different soils to filter all the water you poured through them? (Answers will vary. Expect students to provide some data to support their response.)
4. How might you modify your original question if you were to conduct this investigation again? (Answers will vary.)
5. Summarize below how well the different soils filtered the colored water. (Answers will vary.)

Exploration III

In this activity, students will make observations about characteristics of rocks and sort them into at least three categories.

Materials:

• For each group:

set of at least six rocks that can be organized into two or three groups based on physical characteristics such as color, shape, grain size, texture, and density.

sample of conglomerate rock such as breccia (any rock that shows evidence of having been another rock in the past will suffice)

	magnifying glass or hand lens Divide students into groups of two to five, depending on your materials supply and the number of students. Give each group a set of at least six rock samples that can be sorted into several groups based on clearly observable physical characteristics. Provide hand lenses to students and explain that these will be used to look at very small features on the rocks. If students have not used a hand lens before, you will want to show them how to do it. Explain to students that they should examine each rock closely and make notes about its characteristics. Then, they should sort the rocks into at least three different groups based on their characteristics or properties. Students might, for example, choose to group rocks by color, shape, grain size, layering, presence of fossils, or density. You may want to model making and recording observations as well as the thought process of sorting. Tell the groups that they must sort the rocks at least three different ways. (e.g., If they sort by color, then they must sort the second time using a different characteristic and a third time using another characteristic.) It may be helpful to you to make each student in a group responsible for one round of sorting, in order to observe their ability to sort objects by properties. ***Communicating*** Circulate among the groups as they are working to make sure they are making careful observations. As you circulate, have students explain how they are sorting the rocks and why they put rocks in certain groups; look for students who are struggling with the idea of grouping by characteristic. All students should be contributing to the activity. This activity is designed to encourage students to observe the rocks closely, and to compare different rocks to each other. Students should be able to justify their choices, but they do not need to sort the rocks exactly as a scientist would. Students can record their findings in the Student Investigation Sheet. You may wish to take notes regarding students' mastery of the sorting process. After each group has come up with three classification schemes, have group members present the scheme they think is best to the class. Have students compare the schemes and discuss how each scheme might be useful. Encourage students to think about other ways they might have classified the rocks. Explain that it is most useful if everyone uses the same classification system. But what should that system be? Pose the question or guide students to ask the question, How do scientists classify rocks? ***Evaluating*** 1. How does the hand lens help you observe the characteristics of the rocks? Sample answer: The hand lens lets you see details on the surface of the rocks that are difficult to see with the naked eye. For example, there are fine grains in some rocks that you can see with a hand lens but may not see without one. 2. Describe the characteristics your group used to sort the rocks. Sample answer: The characteristics used depend on the rocks you observe. For example, you may sort by color, shape, grain size, layering, presence of fossils, or density. 3. Think about the characteristics you used to sort the rocks. Were your characteristics the only way to sort them? Explain your answer. Sample answer: Rocks can be sorted by many characteristics (color, shape, grain size, layering, presence of fossils, and	

	density are just some examples). Since each group sorted by only three different characteristics, these aren't the only ways to sort them. 4. Would your categories that you sorted by be different if you had not used the hand lens? Sample answer: To describe characteristics such as color and density, the hand lens would not have made a difference. To describe characteristics like grain size, layers, and the presence of fossils, the hand lens might help. 5. What are some reasons that scientists and engineers might sort rocks? Sample answer: Scientists might sort rocks in order to classify them by how they formed or what they are made of. Engineers might sort them based on what they can be used for.	
	Exploration IV In this activity, student groups create different types of fossils and then share their fossils with new groups. The new group of students must make observations and predict what the fossil is and what its environment must have been like. Materials List (per group) • Cornstarch • Baking soda (sodium bicarbonate) • 2 ½ cups cold water • Outside items to fossilize (twig, leaf, acorn, etc.) • Wax paper • Metric ruler • Hand lens At least 24 hours prior to class, prepare the fossil dough by mixing together the cornstarch, baking soda, and cold water. Stir the mixture over medium heat until it has a mashed-potato consistency. This will take about six minutes. Put the dough on a plate and cover with a damp cloth until it is cool. Then, knead and shape the dough into one-inch balls. Store them in a plastic bag in the refrigerator until you are ready to use them. 1. Take students outdoors. Have them look for an object, like a leaf or an acorn, to fossilize. The object should represent a living thing. Be aware of students who may have allergies to outdoor pollen and/or plants. Once the items are collected, return inside. 2. Have students work in groups of three. Give each group a piece of waxed paper and a ball of fossil dough. Students should mash their ball into a disc and then press their object into the dough until it makes an imprint. Set aside the dough with the impressions until the pieces dry to form "fossils." 3. Have each group share its dried fossil with another group. Have group members use hand lenses to examine the fossils and take notes in their journals about what they observe about the fossils. Guide students in noting information that can be gathered	

	from the fossil (e.g., the leaf has pointed tips). Tell students to record quantitative information about the fossil by using the ruler to measure the fossil. (When measuring particularly small details, it may help to view the details through the hand lens.) 4. Finally, have students predict what their assigned fossil is and what its environment must have been like. ***Communicating & Evaluating*** 1. How were you able to predict what the fossil is? Possible answer: I could see the outline of pointed tips, so I know it is the fossil of a leaf. 2. How were you able to predict the kind of environment in which the fossilized organism lived? Possible answer: If the fossil is a leaf, then I know it must have lived in an environment with water and soil. 3. What might a scientist learn about an organism by studying fossils? Sample answer: Scientists can learn about the size and shape of the animal or plant. They can learn about what kind of environment the fossil lived in, such as on land or in water.	
	Exploration V In this activity, students view soil samples using microscopes and/or hand lenses. They record their findings in their science notebooks and use the results to analyze the different types of soil they observe. Materials: Soil samples: clay soil, sandy soil, humus, potting soil Chart paper to help record class responses Micro-projector or computer camera with close-up lens (optional) For each small group: Microscope (100x or less with wide-field eyepiece will work best) and magnifying lens Prepare three or four marked slides, labeled A, B, C, and D with a different type of soil on each slide Water dropper with water, for dropping single drops of water onto the soil samples on the slides Cover slips (if you are concerned about the objective lens being scratched) each student: A pencil with eraser A science notebook Use the same soil samples to prepare the slides (A, B, and C) for each group so that they can compare their results after the Hands-On Activity.	

	Microscopes need only to be what you have available; students do not need to do high powered magnifications for the activity. Magnifying glasses will suffice if they are strong. Note: a wide-field eyepiece on a microscope makes viewing by children at this age much easier. If a micro-projector is available, it is very helpful to use it in demonstrating the view that students should have in their microscopes. Check the microscopes in advance to be sure that the objective lenses do not descend all the way to the stage. This setting can be adjusted. If the objective lens touches the soil sample, it will need to be cleaned carefully with water to avoid scratching the lens. Divide students into small groups. Make sure each student has their science notebook and a pencil to record what they see. You will need chart paper to record class responses. Each group will need one microscope, one dropper with water, and several slides with a different type of soil on each slide. Tell students that they will be examining the soil to make detailed observations. If students have not used microscopes in your class before, be sure to instruct them on the proper use of the microscope and correct handling of the slides. If you have a micro-projector, you can demonstrate how to prepare the slide and place it for observation. Demonstrate how to mount the slide on the microscope and view it. Choose a view and, on the chart paper, demonstrate how you would sketch and label what you see. Note that they may not have names for all the things they see. Explain that they will use one page in their notebooks for each slide. Demonstrate how to carefully add water to the soil. Instruct students to view all of the slides under magnification. They should use the lowest magnification that the microscope has. Below their sketches, have them write their observations about each slide. They should include details about color, particle size, and consistency (is the soil the same all over?). ***Communicating*** They should observe each slide dry, and observe it again after dropping one drop of water on it. After all groups have observed all slides, both dry and wet, have them complete their recording, then share their observations with the class. Record their responses on the chart paper.	
Connected Tier 1 Unit	*CKLA: The History of the Earth*	

Connected Writing Activities	Focus skill: Sentence creation ● Topic Verb Finish	