"Earth Materials"
Grade 3 – Summative Assessment

Assessed Understandings

Students will understand:

1. Physical properties of rocks and minerals determine their function.

2. Tools are used to determine the physical properties of rocks and minerals.

3. People use rocks and minerals to meet their needs. The use of rocks and minerals are determined by their physical properties.

Teacher Notes for the "Earth Materials" Assessment

These items are designed to provide an assessment of what students know, understand, and can do at the completion of the (FOSS) "Earth Materials" module. This document includes teacher directions, response sheets for the individual students, and analytic scoring rubrics for each question. A separate document contains the anchor papers for each question. **A close look at the rubrics prior to the administration of the assessment will be helpful to the teacher.**

Time and Preparation for the Assessment

This assessment should take about **one hour** to administer. The assessment needs advance preparation and an understanding of what is in the assessment box. You are free to read aloud any or all portions of the assessment to your students. Without giving away a more appropriate response, **please help students understand the intent of the question or task**. This is not a test of reading, writing, or artistic ability. Students may be encouraged to use any and all resources available, including material from classroom charts and individual journals. Please use the terminology from the investigations within this kit.

Prior to the assessment, the teacher will need to have the following materials *from the kit* available for each student—students may share if needed:

- Use samples of Quartz, Feldspar, and Mica from your classroom kit. Pegmatite is given as a separate assessment material. Make one set for each group of four students.
- Place the Quartz samples in bags and label the outside of the bags "A".
- Place the Pegmatite samples in bags and label the outside of the bags "B".
- Place the Feldspar samples in bags and label the outside of the bags "C".
- Place the Mica samples in bags and label the outside of the bags "D".

Question 1: This is a focus question to allow the students to refer to hands-on earth material samples. This question is not to be scored; however the chart must be prepared individually and independently.

1. Sort the samples of earth materials into two groups, **rocks or minerals**. Show your results by writing the letters of the samples in the chart below.

Question 2: Students refer back to their responses for Question 1 from the chart.

2. What is the difference between a rock and a mineral?

Question 3: For each group of students, prepare two sets of earth materials' samples for building the outside statue by doing the following:

- Use samples of Calcite, Quartz, and Gypsum from your classroom kit. Each of the following samples must be placed in a clear bag. Label the outside of the bag with the letter that corresponds to the sample.
- Place the Calcite in a bag and label the outside of the bag "X".

- Place the Quartz in a bag and label the outside of the bag "Y". Place the Gypsum in a bag and label the outside of the bag "Z".

DO NOT PLACE THE ACTUAL ROCK OR MINERAL NAME ON THE BAG.

The State of Delaware is going to build an outside statue. Three different earth materials were suggested for building this statue: Samples X, Y, and Z. Listen to your teacher's instructions to complete the charts. Write the physical properties of your samples on the chart below.

The teacher will instruct the students that they are working individually during this part of the assessment but are sharing the samples. The students are to observe the samples and write physical properties for each on the chart.

3. Refer to Physical Property Chart on page 3 of the summative assessment.

Question 4: The teacher will remind the students that they are working individually while they are testing the samples. They will use the tools in the bag to indicate whether the sample can or cannot be scratched by the penny, paper clip, and their fingernail. When they finish the scratch test have them proceed to the vinegar test. All responses are to be recorded on the chart.

4. Refer to the Testing Chart on page 3 of the summative assessment.

Question 5: Students determine that sample X is the mineral Calcite. The teacher will redirect the students to draw their conclusions from their results of testing vinegar on the samples. (Students are made aware that the name of the mineral is expected and not the letter of the sample.)

5. What **mineral** does the "Vinegar Test" indicate? Explain your answer using the results from your testing.

Question 6: The teacher will explain that the students will draw conclusions about the best outside statue. The evidence for the conclusions will be drawn from the students testing of the samples.

6. Which sample—X, Y, or Z—would make **the best** outside statue?

   Circle one: X Y or Z

   Give **two reasons** why this sample would be good for an outside statue using evidence from your chart.

Scoring Rubrics
"Earth Materials"
Summative Assessment

Question 1: Sort the samples of earth materials into two groups, rocks and minerals. Show your results by writing the letters of the samples in the chart below.

This question measures a student's ability to generate an explanation of the difference between a rock and a mineral by sorting the samples. This is a focus question. It is not scored.

Rocks	Minerals
Pegmatite (B)	Quartz (A) Feldspar (C) Mica (D)

Question 2: What is the difference between a rock and a mineral?

This question measures a student's ability to generate an explanation of the difference between a rock and a mineral.

Criterion for a complete response:

1. Writes an appropriate response to explain the difference between a rock and a mineral (e.g., rocks are made of many ingredients, including mineral; minerals are made of just one ingredient).

Code	Response
	Complete Response
10	Meets criterion above.
19	Any other correct response.
	Incorrect Response
70	Writes an explanation that is not clearly stated.
76	Response repeats the stem of the question.
79	Any other incorrect response.
	Non-Response
90	Crossed out, erased, illegible, or impossible to interpret.
99	Blank.

Question 3: The State of Delaware is going to build an outside statue. Three different earth materials were suggested for building this statue: Samples X, Y, and Z. Write the physical properties of your samples on the chart below.

This item measures a student's ability to observe and describe specific physical properties of earth minerals.

Criteria for a complete response:

1. Makes observations to determine the physical properties of earth materials using color, luster, and texture.
2. Gives evidence from observations for the understanding of color, luster, and texture.

Code	Response
	Complete Response
20	Meets criteria above.
29	Any other correct response.
	Partially Correct Response
10	Describes at least two properties for each sample.
19	Any other partially correct response.
	Incorrect Response
70	Describes only colors correctly.
71	Describes only lusters correctly.
72	Describes only textures correctly.
79	Any other incorrect response.
	Non-Response
90	Crossed out, erased, illegible, or impossible to interpret.
99	Blank.

Write the physical properties of your samples on the chart below.

Sample X	Color:	Luster:	Texture:
Sample Y	Color:	Luster:	Texture:
Sample Z	Color:	Luster:	Texture:

Question 4a: The State of Delaware is going to build an outside statue. Three different earth materials were suggested for building this statue: Samples X, Y, and Z. Listen to your teacher's instructions to complete the charts. Write your results on the chart below.

This item measures a student's ability to conduct the scratch test on minerals and record data on a chart.

Criteria for a complete response:

1. Performs scratch test.
2. Records accurate data.

Code	Response
	Complete Response
20	Meets criteria above.
29	Any other correct response.
	Partially Correct Response
10	Completes scratch test chart with one mistake (e.g., puts a no for the penny test for calcite).
19	Any other partially correct response for one mineral.
	Incorrect Response
70	Collects inaccurate data (e.g., records more than one incorrect answer for more than one mineral).
79	Any other incorrect response.
	Non-Response
90	Crossed out, erased, illegible, or impossible to interpret.
99	Blank.

Write your results on the chart below.

Scratch Test				**Vinegar Test**
Earth Material Sample	Paper Clip Test	Penny Test	Finger Nail Test	Vinegar Test Results
Sample X	Yes	Yes	No	
Sample Y	No	No	No	
Sample Z	Yes	Yes	Yes	

Question 4b: Perform the vinegar test on all three samples. Record your results on the chart under "Vinegar Test."

This item measures a student's ability to perform the vinegar test on minerals and record the data on a chart (fizz or does not fizz).

Criteria for a complete response:

1. Performs the vinegar test.
2. Records accurate data on the chart.

Code	Response
	Complete Response
20	Meets criteria above.
29	Any other scientifically accurate response (e.g., student records vinegar as an acid).
	Partially Correct Response
10	Completes vinegar test chart with one mistake.
19	Any other partially correct response.
	Incorrect Response
70	Inaccurate data.
79	Any other incorrect response.
	Non-Response
90	Crossed out, erased, illegible, or impossible to interpret.
99	Blank.

Write your results on the chart below.

Scratch Test				**Vinegar Test**
Earth Material Sample	Paper Clip Test	Penny Test	Finger Nail Test	Vinegar Test Results
Sample X				Fizzes
Sample Y				Does not fizz
Sample Z				Does not fizz

Question 5: Name the mineral that fizzes when you put vinegar on it. Explain your answer using the results from your testing.

This item measures a student's ability to determine that the mineral is calcite.

Criteria for a complete response:

1. Lists **Calcite** as the mineral that reacts with vinegar.
2. Gives evidence from the Test Results chart that sample X fizzed when vinegar was added, proving that it had **Calcite** in it.

Code	Response
	Complete Response
20	Meets criteria above.
21	Uses results from the vinegar test to support their choice.
29	Any other scientifically correct response.
	Partially Correct Response
10	Mineral correct, explanation incorrect.
11	Explanation correct, incorrect mineral.
19	Any other partially correct response.
	Incorrect Response
70	Writes an explanation with no supporting evidence.
71	States evidence with no reasons.
79	Any other incorrect response.
	Non-Response
90	Crossed out, erased, illegible, or impossible to interpret.
99	Blank.

Question 6: Which sample of earth materials—X, Y, or Z—would make the best outside statue? Circle one: X, Y, or Z. Give two reasons why this sample would be good for an outside statue using evidence from your charts.

This item measures a student's ability to identify key physical properties for constructing an outdoor statue and to use data to support their choice of a building material.

Criteria for a complete response:

1. Chooses Y, Quartz, as the best material.
2. Draws a conclusion making the connection between the test results and the durability of the materials—**scratch test** – hardness; v**inegar test** – effects of acid).
3. Uses physical properties from observations to support their choice (luster, color, and texture).

Code	Response
	Complete Response
20	Meets criteria above.
21	Uses test results to support their choice.
29	Any other scientifically correct response.
	Partially Correct Response
10	Uses only scratch test to support conclusions.
11	Uses only vinegar test to support conclusions.
12	Uses only observations to support conclusions.
19	Any other partially correct response.
	Incorrect Response
70	Writes an explanation with no supporting evidence.
71	States evidence with no reasons.
76	Repeats the stem of the question.
79	Any other incorrect response.
	Non-Response
90	Crossed out, erased, illegible, or impossible to interpret.
99	Blank.

