

Student Science Performance

Grade 6th grade Earth Science

Title:

Topic: Weathering and Erosion

What's Happening to the Earth?

Performance Expectation for GSE:

S6E5. Obtain, evaluate, and communicate information to show how Earth's surface is formed.

- d. Ask questions to identify types of weathering, agents of erosion and transportation, and environments of deposition.
(*Clarification Statement:* Environments of deposition include deltas, barrier islands, beaches, marshes, and rivers.)
- e. Develop a model to demonstrate how natural processes (weathering, erosion, and deposition) and human activity change rocks and the surface of the Earth.

Performance Expectations for Instruction:

- List the components of soil: parent material (i.e. sand), clay/silt, and organic matter.
- Explain weathering.
- Recognize erosion and give examples of ways in which we keep topsoil from eroding in the garden.
- Identify the different components in soil.
- Define physical weathering.
- Explain types of deposition
- Develop a model of how natural and human processes change rock and the surface of the Earth

[Additional notes on student supports](#)

Materials:

Weather, erosion, deposition activity

- water table (either commercial or teacher made one) or small rectangular pans (if using in small groups)
- Students bring in soil samples,
- “bare” soil, grass covered soil,
- hose or watering can.

Stations for Glaciers, Water, and Wind, Oh My! (This includes the materials for the stations that students rotate through.)

- glass tray or Petri dish
- rock samples that contain calcite mineral (calcium carbonate), such as limestone, marble, certain cements/mortars, other rock samples, such as brick, granite, most gravel
- weak acid, such as lemon juice or vinegar
- Eyedropper
- magnifying glass
- paper towels
- large container, such as a deep plastic bin at least 18 x 9 inches (46 x 23 cm)
- moist soil
- 12 coins or plastic chips
- watering can that has several holes in the spout
- water
- ruler
- sand
- small-size motorized fan, handheld is preferred
- large bin or box with no top
- ice cubes, enough for one per group
- modeling clay
- heat source, such as a burner or hot plate

- 3 glass beakers
- Ice
- plastic tongs
- goggles
- marbles, one per group

Students will continuously obtain, evaluate, and communicate information. This is not a linear process. Students will communicate through writing and discussions to allow for formative assessment. This benefits the teacher, student, and whole group to guide instruction to clarify misconceptions or extend content.

Engaging Learners

Phenomenon:

Teachers will compile several pictures that show weathering, erosion, and deposition and display them.



Obtaining: What do you think caused these landforms?

Evaluating: Using a [three-column graphic organizer](#), students will list how the landforms ended up the way they are in the pictures.

Communicating: Students will spend time talking to their partner discussing how they think this happened.

Exploring

Obtaining: Students will use water tables.



[Weathering, Erosion, and Deposition Exploration](#)

Formative Assessment of Student Learning

Explaining

Obtaining [Weathering, Erosion, and Deposition](#) Use this as an individual lab using small rectangular pans or as a class demonstration to determine how weathering, erosion, and deposition occur. Does having ground cover help prevent weathering, erosion, and deposition. Another activity that can be used: [The Nature of the Land](#)

Evaluating: Have students bring a “baggie” of soil. Taking a little from each sample or making stations have students will list the [components of the soil](#). Discuss which components would weather the easiest. Describe how this demonstrates physical weathering.

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| | <p><i>Communicating</i> Students will</p> <ul style="list-style-type: none"> ● Identify the different components in soil. ● Define physical weathering. <p>Have students choose an adult: parent, gardener, landscapers, extension agent and ask them to make observations of erosion in their area or line of work and how they prevent it. Students will then return to class and walk around the school or community, if that is a possibility. When they return have them discuss how the methods used by the people they interviewed could be used.</p> <p>Observe and explain the erosion demonstration- how erosion occurs and how erosion can be prevented.</p> |
| <p>Elaborating Applying Model to Solve a Problems</p> | <p>Phenomenon: Erosion Around You</p> <div style="display: flex; justify-content: space-around;">   </div> |
| | <p><i>Obtaining</i> Students obtain information about the effect of erosion on Earth’s features. After discussion prompted by the photos, students take a walk around their campus looking for additional signs of weathering and erosion. Students ask questions about the specific evidence they observe. For example, where might ___ have originated? How do you think ___ got here?</p> <p><i>Guiding Questions:</i> What is erosion? What other examples of erosion have you seen? What do you think caused this? What is the difference between weathering and erosion?</p> <p><i>Obtaining/Evaluating/Communicating</i> Students explore five different types of erosion at stations, record their observations, and discuss outcomes whole group or as monitored by teacher.</p> <p><i>Erosion Stations Worksheet:</i> Glaciers, Water and Wind, Oh My! Activity – Erosion Worksheet</p> <p><i>Resource:</i> Teacher's Guide to Glaciers, Water and Wind, Oh My! Activity – Erosion Worksheet</p> |
| | <p><i>Evaluating</i> Students calculate the effect of erosion in each of the five scenarios.</p> <p>Erosion Math Worksheet</p> |
| | <p><i>Communicating</i> Students develop visual models with an explanatory caption of the five types of erosion and its effect on earth’s surface explored in each station.</p> |



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| | <p>Students move through the process in their minds thinking about how land is changed through weathering as well as the moving of that sediment through erosion. Teacher will guide them to a discussion by asking, “Where will all of these sediments end up?”</p> <p>Words like “at the end” of a river, in the ocean, on the beach should be used in discussion. Have students think if they have ever seen sand dunes, barrier islands, marshes, or sand bars in a river.</p> <p>Investigating sediments and deposition</p> <p>Students will research pictures of deltas, barrier islands, beaches, marshes, and rivers to either draw on a poster or in a slide presentation and explain how these types of depositions occurred.</p> <p><i>Teacher Notes: These can come from an internet search or books from the media center or science books.</i></p> |
| Evaluation | Assessment of Student Learning |
| | <p>Multiple activities in this segment will serve as assessments, formative included, that provide evidence of student learning. It is important to evaluate student writing and class discussion. Students should be able to connect lab activities and stations to real-world examples.</p> |
| SEP, CCC, DCI | Science Essentials |
| Science and Engineering Practices | <ul style="list-style-type: none"> ● Asking questions and defining problems ● Developing and using models |
| Crosscutting Concepts | <ul style="list-style-type: none"> ● Cause and Effect ● Patterns |
| Disciplinary Core Ideas | <p>From A Framework for K-12 Science Education:</p> <ul style="list-style-type: none"> ● ESS1.C: The History of Planet Earth ● ESS2.A: Earth Materials and Systems ● ESS2.C: The Role of Water in Earth’s Surface Processes ● ESS3.C: Human Impacts on Earth’s Systems |

Additional Supports for struggling learners:

The following supports are suggestions for this lesson and are not the only options to support students in the classroom. These supports target students that struggle with science material, this lesson or a previous lesson. These are generalized supports and do not take the place of IEP accommodations as required by each student’s Individualized Education Program.

General supports for the following categories:

| <u>Reading:</u> | <u>Writing:</u> | <u>Math:</u> |
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| <ol style="list-style-type: none"> 1. Provide reading support by reading aloud or doing partner reads 2. Have the teacher model what they are thinking when reading the text 3. Annotate the text with students so that they may refer to it as they work through the activities. | <ol style="list-style-type: none"> 1. The teacher can provide a sentence starter for the students. 2. The teacher can give students an audience to write to (i.e. Write a letter to your sibling explaining this topic). 3. The teacher can provide constructive feedback during the writing process to help students understand the expectations. | <ol style="list-style-type: none"> 1. Provide calculators as needed. 2. Provide graph paper as needed. |

Supports for this specific lesson if needed:

Performance expectations for instruction:

1. The teacher should provide information to students in various formats to reach as many students as possible.
2. The students should be given adequate time to complete each part of the lesson.
3. The students should be allowed to express their knowledge in various formats.
4. The teacher should be sure to provide multiple ways for the students to communicate their knowledge of the material.

Engage:

1. The teacher should have clear and consistent guidelines for discussion. These guidelines should help students feel more comfortable and be more likely to participate.
2. The teacher should be sure to provide multiple ways for the students to communicate their knowledge of the material. These formats could include writing, drawing or designing a play.
3. The teacher should use intentional and flexible grouping to group students. Best practice is to use data to drive student groupings.
4. Students may need additional time to complete their assignment.

Exploring:

1. The teacher should be sure to provide multiple ways for the students to communicate their knowledge of the material. These formats could include writing, drawing or designing a play.
2. The teacher should use intentional and flexible grouping to group students. Best practice is to use data to drive student groupings.

3. Students may need additional time to complete their assignment.

Explaining:

1. The teacher may need to consider using groups to complete the lab.
2. The teacher should be prepared to repeat directions as needed.
3. The teacher should ensure that students have ample time at each station.
4. The teacher should have clear and consistent guidelines for discussions. These guidelines should help students feel more comfortable and be more likely to participate in the discussion.
5. The teacher should consider providing students with an organizer to record data, observations and research.
6. The teacher should consider providing students with questions stems to assist the students in generating questions.
7. The teacher should consider providing students with questions or sentence frames to use as conversations starters for the gallery walk.
8. The teacher should consider doing the demo more than once so that students can make observations.

Elaborating:

1. The teacher should consider providing students with sources to use in their research.
2. The teacher should consider providing students with question stems to assist students in generating questions.
3. The teacher should have clear and consistent guidelines for discussions. These guidelines should help students feel more comfortable and be more likely to participate in the discussion.
4. The teacher should ensure that students get ample time at each station.
5. The teacher should consider a formative assessment to determine which students need reviewing, re-teaching or enriching.
6. The teacher should explicitly teach students to calculate the effect of erosion.
7. The teacher should be sure to provide multiple ways for the students to communicate their knowledge of the material. These formats could include writing, drawing or designing a play.
8. Students may need additional time to complete their assignment.

Evaluating:

1. The teacher should consider giving students multiple options to express their knowledge. These options could include writing, drawing or designing a presentation.
2. The teacher should complete a formative assessment several times throughout the lesson and re-teach, review and enrich as needed.



What caused these landforms?

Weathering

Erosion

Deposition

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[Return to Instructional Segment](#)

Components of the Soil

Name _____

1. Using a magnifying glass or a microscope, observe the different types of soil.
2. What are the components that you see in the soil?
3. Now looking at different samples describe the amounts (percentages) of each component.

Sample A

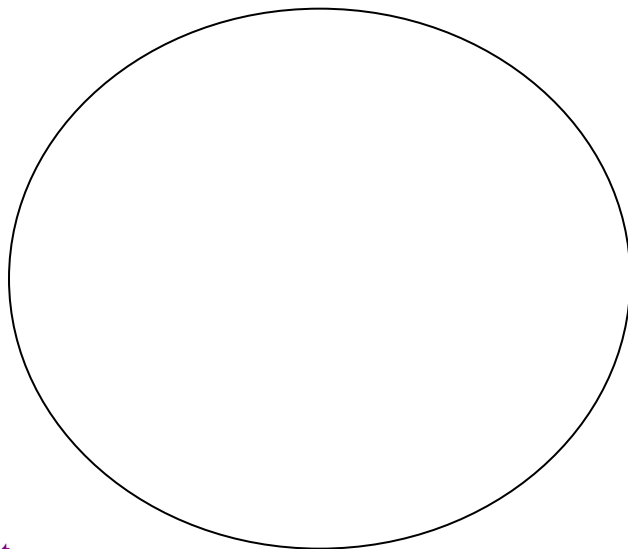
Sample B

Sample C

Sample D

4. Using a pie graph, show the percentages of the components in one of the samples.

Sample _____



[Return to Instructional Segment](#)