

Rocks and Soil • Cycle • Change



Unit Essential Question

How are rocks and soil formed and how do they change over time?

UNIT DESCRIPTION

In this arts integrated unit, students will explore Rocks and Soil. These projects focus on bringing multiple art forms to the Earth Sciences for third graders. Students will focus on comparing and contrasting the 3 types of rocks, as well as their attributes. They will create and perform a riddle in which the class will try to guess which rock the riddle represents. The students will analyze the rock cycle by composing small group dance compositions. Students will take a “Gallery Walk” viewing photographs of different types of soil in its natural setting and illustrate their own version of soil in its natural setting.

PROJECTS

(1-2 Weeks)

- Word Art & Rock Riddles
- Soil Study Artistic Renderings
- The Rock Cycle Dance

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Units provide differentiated ideas and activities aligned to a sampling of standards.

The units do not necessarily imply mastery of standards, but are intended to inspire and equip educators.

Produced through the U.S. Department of Education: Arts in Education—Model Development and Dissemination Grants Program
Cherokee County (GA) School District and ArtsNow, Inc.

UNIT OVERVIEW

Unit Description	Table of Contents
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UNIT ESSENTIAL QUESTION

How are rocks and soil formed and how do they change over time?

CROSS-CUTTING INTERDISCIPLINARY CONCEPT

Cycle
Change

REAL WORLD CONTEXT

We study rocks and soil because they make up the surface of the Earth. Geologists study rocks and soil to discover things like Earth's history through fossils, or how water, wind and ice shape the Earth's surface.

STANDARDS

Curriculum Standards	Arts Standards
S3E1 Students will investigate the physical attributes of rocks and soils	VA3AR.1 Discusses his or her artwork and the artwork of others
S3CS8 Students will understand important features of the process of scientific inquiry	VA3C.2 Develops life skills through the study and production of art
ELAGSE3SL4 Report on a topic or text, tell a story, or recount an experience with appropriate facts and relevant, descriptive details, speaking clearly at an understandable pace	VA3PR.2. Understands and applies media, techniques, and processes of two-dimensional art processes (drawing, painting, printmaking, mixed-media) using tools and materials in a safe and appropriate manner to develop skills a. Creates drawings with a variety of media (e.g., pencils, crayons, pastel)
ELAGSE3SL1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 3 topics and texts, building on others' ideas and expressing their own clearly	TAES3.3 Acting by developing, communicating, and sustaining roles within a variety of situations and environments

ASSESSMENTS**Summative Assessments**

- Students will write an informational essay demonstrating their knowledge of the following: the 3 different types of rocks, their attributes, as well as how each type of rock is created. (See Downloads for the **Informational Writing Rubric**.)
- Video recording of Rock Cycle Dances
- Students could write about the process of creating the rock cycle dance as a reflection writing piece. They could also critique or evaluate their peers when they perform their dance compositions.

PARTNERING WITH FINE ARTS TEACHERS

Visual Arts Teacher:

- Additional support in Project 2: Soil Study Artistic Renderings
 - Assist with nature photography techniques and layout
 - Assist with styles and techniques for artistic renderings
 - Assist with providing ideas for different examples of nature photography or artistic renderings of rocks and soil and the plant/animal life they support

Dance Teacher:

- Additional support in Project 3: The Rock Cycle Dance
 - Assist with dance terminology, locomotive movements, and creating cyclical choreography

CHARACTER EDUCATION COMPONENTS

Students have opportunities to become “experts” on the rock cycle and teach the cycle to their peers. In this process they teach the types of rocks and how over time they change.

CHARACTER ATTRIBUTES

Solid as a “rock”
Integrity
Reliability
Patience
Perseverance

APPENDIX

- **Blank 3-Column Chart**
- **Informational Writing Rubric**
- **Examples of Nature Photography**
- **Reflection Questions-Soil Study**
- **Choreography Planning Document**

CREDITS

U.S. Department of Education
Arts in Education--Model Development and Dissemination Grants Program
Cherokee County (GA) School District and ArtsNow, Inc.
Ideas contributed and edited by: Diane McMullen, Edith Alexander, Liz Pendlington, Jessica Espinoza, Richard Benjamin Ph.D., Michele McClelland

Project 1: Rocking Word Art & Riddles

Rocks • Igneous/Sedimentary/
Metamorphic • Compare & Contrast



Project Essential Questions

- What are rocks?
- How are the 3 types of rocks formed?
- How are the 3 types of rocks alike and different?

PROJECT DESCRIPTION

In this arts integrated project, students will use visual arts and theatre to apply their knowledge of rocks. Students will create a Word Art illustration focusing on one of the 3 types of rocks. Students will then create and perform a riddle and or monologue in which the class (audience) tries to guess which rock it represents. Students will compare and contrast the attributes/characteristics of igneous, sedimentary, and metamorphic rocks.

LEARNING TARGETS

“I Can...”

- Identify the 3 types of rocks
- Classify the 3 types of rocks
- Perform and create a monologue/ riddle describing the 3 types of rocks
- Compare and contrast the 3 types of rocks

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Duration: 1- 2 days

Project Description	Learning Targets
In this arts integrated project, students will use visual arts and theatre to apply their knowledge of rocks. Students will create a Word Art illustration focusing on one of the 3 types of rocks. Students will then create and perform a riddle and or monologue in which the class (audience) tries to guess which rock it represents. Students will compare and contrast the attributes/characteristics of igneous, sedimentary, and metamorphic rocks.	<p>"I Can...":</p> <ul style="list-style-type: none"> Identify the 3 types of rocks: igneous, sedimentary, and metamorphic Classify the 3 types of rocks: igneous, sedimentary, and metamorphic Perform and create a monologue/riddle describing the 3 types of rocks: igneous, sedimentary, and metamorphic Compare and contrast the 3 types of rocks: igneous, sedimentary, and metamorphic

ESSENTIAL QUESTIONS

- What are rocks?
- How are the 3 types of rocks formed?
- How are the 3 types of rocks alike and different?

STANDARDS

Curriculum Standards	Arts Standard
<p>S3E1 Students will investigate the physical attributes of rocks and soils</p> <p>S3CS8 Students will understand important features of the process of scientific inquiry</p> <p>ELAGSE3SL4 Report on a topic or text, tell a story, or recount an experience with appropriate facts and relevant, descriptive details, speaking clearly at an understandable pace</p> <p>ELAGSE3SL1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 3 topics and texts, building on others' ideas and expressing their own clearly</p>	<p>VA3AR.1 Discusses his or her artwork and the artwork of others</p> <p>VA3C.2 Develops life skills through the study and production of art</p>

KEY VOCABULARY

Content Vocabulary	Arts Vocabulary
<ul style="list-style-type: none">• Rock• Igneous• Sedimentary• Metamorphic• Attributes/characteristics of rocks:<ol style="list-style-type: none">1. Shape2. Color3. Texture4. Hardness	<ul style="list-style-type: none">• Illustration• Monologue• Character traits• Performance• Word Art

ASSESSMENT

Formative	Summative
<ul style="list-style-type: none">• Students could be observed while performing their riddles to assess their knowledge of the 3 different types of rocks.	<ul style="list-style-type: none">• Students will write an informational essay demonstrating their knowledge of the following: the 3 different types of rocks, their attributes, as well as how each type of rock is created. (See Downloads for the Informational Writing Rubric.)

MATERIALS

Chart paper; samples of igneous, sedimentary, and metamorphic rocks; **Blank 3-Column Chart** and **Word Arts Examples** (see Downloads); magnifiers; colored construction paper; markers; document camera

Activating Strategy

- Each table/group will be given 3 samples/examples of rocks
- Using a **Blank 3-Column Chart**, the groups will discuss and fill in their chart writing down their observations

*Students should note the attributes in size, texture, color, hardness, softness, etc. They should be able to identify all 3 rocks: igneous, sedimentary, and metamorphic. The students are also to explain how each rock is created in a different manner than the others. (See Downloads for the **Blank 3-Column Chart.**)

- Each group shares their observations with the rest of the class. The teacher could compile the group observations into one large 3 column chart paper.

Main Activity

Part 1

- Each small group is asked to create a riddle for an assigned rock (igneous, sedimentary, metamorphic).
- Teacher demonstrates and shares an example of a rock riddle: I am smooth to the touch. I am round in size and gray in color. Where you may find me is in the river. What type of rock am I?

Part 2

- Each small group is asked to go to the front of the class and perform their riddle.
- The class will then try to guess which type of rock is being demonstrated by the words given in the riddles along with any movement that may assist in better understanding.

Part 3

- Students will use a piece of colored construction paper or cardstock to write their riddles.
- They will fold the sheet in half, write the riddle on the front cover, then write the answer under the flap.
- Take the student-created riddles and showcase them somewhere specific in the classroom.
- Create an interactive display where the students can go to read the riddles and then flip display open to view the riddle's answer.

Part 4

- Students will be given a piece of thick art paper.
- Students select one of the 3 types of rocks: igneous, sedimentary, metamorphic.
- Direct students to use Word Art in order to express the type of rock they chose.
- The students are to consider the type of chemical/physical change that takes place in order for nature to create the rock. As part of their Word Art, they should illustrate this change in a way that demonstrates the type of new rock that forms. This activity takes some imagination. The students may need to visually see the **Word Art Examples** (see Downloads) in order to fully understand the expectations of the project.

REFLECTION

Reflective Strategies

- Students will write an informational piece demonstrating their knowledge of the following: the 3 different types of rocks, their attributes, as well as how each type of rock is created.
- The informational piece could be taken for a Summative writing or science grade.
- **Informational writing rubric** (see Downloads)

DIFFERENTIATION

Below Grade-Level/EL Students:

- Provide these students with photographs/pictures of the 3 types of rocks so they are able to refer back to the 3 different types of rocks and are using the correct terminology as much as possible while working on the project. These photographs/pictures could be of the 3 types of rocks in their natural settings so these learners are able to make better connections.

Above Grade-Level:

- Allow your higher-level learners as well as gifted students an extension research activity. Put these students in pairs. The small groups will be given a mineral. They are to identify the attributes of their mineral, where their mineral is found, and what the mineral is used for or it's purpose. They are to write a short informational essay using the above information. Then they are to create a "Who Am I" riddle for their assigned mineral. They can then teach this new information to the below level learners as well as the EL students.

(Example of a "Who Am I" mineral riddle: I am yellow and soft. I smell really bad. I leave a yellow stain. I am a mineral. Who am I? Answer = sulfur)

APPENDIX

- **Informational Writing Rubric**
- **3-Column Blank Chart**
- **Word Art Examples**

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Project 2: Soil Study Artistic Rendering

Soil • Compare & Contrast



Project Essential Questions

- How do scientists classify soil?
- How do I distinguish between the four types of soil?

PROJECT DESCRIPTION

This arts integrated project should be taught after the students are able to identify the four types of soil, compare and contrast the four types of soil, as well as classify soil based on its attributes. The students will be led through a “Gallery Walk” of photographs of plants and or animals living in specific types of soil. The students will draw/illustrate/paint a naturescape depicting something (plant or animal) that lives in a specific type of soil.

LEARNING TARGETS “I Can...”

- Identify the four types of soil visually and verbally
- Explain how each type of soil is alike and different from one another
- Classify soil based on the attributes I observe
- Illustrate a specific type of soil along with a living thing that uses the soil for living

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Duration: 1-2 days

Project Description	Learning Targets
This arts integrated project should be taught after the students are able to identify the four types of soil, compare and contrast the four types of soil, as well as classify soil based on its attributes. The students will be led through a "Gallery Walk" of photographs of plants and or animals living in specific types of soil. The students will draw/illustrate/paint a naturescape depicting something (plant or animal) that lives in a specific type of soil.	<p>"I Can...":</p> <ul style="list-style-type: none"> Identify the four types of soil visually and verbally Explain how each type of soil is alike and different from one another Classify soil based on the attributes I observe Illustrate a specific type of soil along with a living thing that uses the soil for living

ESSENTIAL QUESTION

<ul style="list-style-type: none"> How do scientists classify soil? How do I distinguish between the four types of soil?
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STANDARDS

Curriculum Standards	Arts Standard
<p>S3E1 Students will investigate the physical attributes of rocks and soils c. Use observation to compare the similarities and differences of texture, particle size, and color in top soils (such as clay, loam or potting soil, and sand)</p> <p>S3CS8 Students will understand important features of the process of scientific inquiry</p>	<p>VA3C.2 Develops life skills through the study and production of art</p> <p>VA3PR.2 Understands and applies media, techniques, and processes of two-dimensional art processes (drawing, painting, printmaking, mixed-media) using tools and materials in a safe and appropriate manner to develop skills a. Creates drawings with a variety of media (e.g., pencils, crayons, pastel)</p>

KEY VOCABULARY

Content Vocabulary	Arts Vocabulary
<ul style="list-style-type: none"> Clay Silt Loam Sand Topsoil Subsoil Bedrock 	<ul style="list-style-type: none"> Illustration Color Photography Gallery Walk Rendering

ASSESSMENTS

Formative	Summative
<ul style="list-style-type: none">The students' naturescape renderings could be used as an assessment tool to ensure the students are correctly identifying the specific soil they are depicting along with the correct corresponding living thing.	<ul style="list-style-type: none">The students' still naturescape could be used as an assessment tool to ensure the students are correctly identifying the specific soil they are depicting along with the correct corresponding living thing.

MATERIALS

White paper, colored pencils, oil pastels, crayons, markers, pencils

Activating Strategy

Explain what nature photography is:

Nature photography focuses on landscapes, wildlife and plant life as they are found in their natural environment. Photographs of nature provide glimpses of animals, forests or mountains that may not be seen in person. Many nature photographers try to educate people about the beauty of nature, often with the hope that more people will be inspired to help the environment. (Definition by www.ehow.com)

Then share examples of nature photography through a Gallery Walk:

Share **Examples of Nature Photography** (see Downloads) with the class through a Gallery Walk to inspire their Soil Study Artistic Renderings that they'll create in the Main Activity.

Questions to ask students during Gallery Walk of images:

What do you see? (Making close observations.)

What do you notice? (Making sound inferences.)

What do you wonder? (What questions do you have for the photographer?)

Main Activity

- Explain that today students will be creating their own nature scene with the concentration being on the type of soil (clay, silt, loam, or sand) they choose along with a living thing that lives in or around the soil.
- Students will sketch out their soil nature scene first then add color using either colored pencils, crayons, oil pastels, etc.
- As the students complete their rendition, they will gather into small groups. They will each share their soil nature scene and ask the group if they are able to tell which type of soil they depicted. The students are to explain their reasonings with one another.
- Display these soil scenes around the classroom and or hallway to elicit conversations regarding the four types of soil.

REFLECTION

Reflection Strategies

After the teacher has completed the differentiation activities, the students will reflect on the following

Reflection Questions (see Downloads) using complete sentences:

- How did my illustration of soil help me to better understand the differences in the four types of soils?
- Which type of soil did you think would hold water the best? Explain why. Which type of soil did not hold water the best? Why?

DIFFERENTIATION

Below Grade Level:

- Students could take their own photographs of soil scenes outside of the school setting and or on their school playground. They could then share their photos with the class having a discussion regarding the soil type and living things that may inhabit that particular type of soil.

Above Grade Level:

- Students could look deeper into the concept of which types of soil holds the most water. Soil types that are able to hold more water may or may not be better to use for farming purposes. This group of students could research the concept of soils ability to hold water. They could then “teach” the other groups/students why knowing which types of soil are able to hold the most water is or is not important to the world around us.

EL Students:

- As a part of the Above Grade Level soil/water research activity, this group of learners could actually do a hands-on experiment using the four types of soil. They could have 4 containers that each contain a specific type of soil, then add water to each to examine which soil holds water most efficiently. This information could then become a part of the soil/water activity.

ADDITIONAL RESOURCES

- Soil resource website: <http://www.soils4kids.org/>
- Soil & water resource website: <http://www.kidsgeo.com/geology-for-kids/0013-waterr-in-soil.php>
- *How Soil Is Made* by Heather L Montgomery
- “What’s the Dirt on...Dirt?” Youtube video: <https://www.youtube.com/watch?v=if29mjcd5bc>

APPENDIX (see Downloads)

- **Examples of Nature Photography**
- **Reflection Questions-Soil Study**

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Project 3: The Rock Cycle Dance

Rock Cycle • Change



Project Essential Questions

- How can dance be used to analyze the rock cycle?
- What are the steps in the rock cycle?

PROJECT DESCRIPTION

In this arts integrated project, third grade students will analyze the rock cycle by composing small group dance compositions. Students will use the dance concepts: body shapes, non-locomotive and locomotive movements to depict how rocks change their form based on physical and chemical changes that naturally occur over time. Groups will observe their peers and evaluate the dance pieces based on their understanding of rocks.

LEARNING TARGETS

“I Can...”

- Use movement to represent the rock cycle
- Identify how the changes in nature result in a new type of rock forming
- Identify all of the steps in the rock cycle

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DURATION: 1-2 days

Project Description	Learning Targets
In this arts integrated project, third grade students will analyze the rock cycle by composing small group dance compositions. Students will use the dance concepts: body shapes, non-locomotive and locomotive movements to depict how rocks change their form based on physical and chemical changes that naturally occur over time. Groups will observe their peers and evaluate the dance pieces based on their understanding of rocks.	<p>"I Can...":</p> <ul style="list-style-type: none">• Use movement to represent the rock cycle• Identify how the changes in nature result in a new type of rock forming• Identify all of the steps in the rock cycle

ESSENTIAL QUESTIONS

<ul style="list-style-type: none">• How can dance be used to analyze the rock cycle?• What are the steps in the rock cycle?
--

STANDARDS

Curriculum Standards	Arts Standard
S3E1 Students will investigate the physical attributes of rocks and soils	D3CR.2. Demonstrates an understanding of dance as a way to communicate meaning a. Uses a combination of improvisation and choreographic tools to create movement based on one's own ideas, feelings, concepts, and kinesthetic awareness b. Recognizes and accurately describes movement and movement elements. c. Moves expressively to music or other accompaniment (e.g., sound, text)

KEY VOCABULARY

Content Vocabulary	Arts Vocabulary
<ul style="list-style-type: none">• Sedimentary rocks• Metamorphic rocks• Magma• Igneous rocks• Weathering• Sediments	<ul style="list-style-type: none">• Body shapes• Body levels• Locomotive movement• Choreography

TECHNOLOGY INTEGRATION

<ul style="list-style-type: none">• A video camera could be used to record each group's performance, allowing for deeper reflection for students by being able to go back and review the recorded performances.

ASSESSMENT

Formative	Summative
<ul style="list-style-type: none">Class discussion, group discussions, reflection questions, anecdotal notes when observing students working in small groups, class reflection/discussion, dances created, and the "Road Maps".	<ul style="list-style-type: none">Students could write about the process of creating the rock cycle dance as a reflection writing piece.They could also critique or evaluate their peers when they performed their dance compositions.

MATERIALS

Video camera, chart paper

Activating Strategy

- As a whole group/class review the rock cycle together by analyzing a diagram.

Suggested images of diagrams:

<http://www.rocksandminerals4u.com/images/rock-cycle-diagram-im.jpg>

<https://s-media-cache-ak0.pinimg.com/236x/ae/9f/e7/ae9fe7b1890fde1b727887c435f5ac26.jpg>

<http://www.cotf.edu/ete/images/modules/msese/earthsysflr/EFCycleP2.gif>

https://www.learner.org/interactives/rockcycle/images/rockintro_08.gif

Dance Warm-Up

- Students will move freely through the space of the classroom while teacher plays instrumental music.
- When the music stops they are to make a body shape.
- Students will explore creating high, mid, and low body shapes.
- Students will create a class list of examples of locomotive movement. (ie. zig-zag, skip, slither, jump)
- As the teacher calls out a few of the locomotive movements from the created list, the students will move freely through the the space demonstrating the assigned movements.

Main Activity

Part 1:

Expectations:

- Place students in small groups and go over the expectations for the dance composition they will create together today.
- Stress that each group must have 3 group body shapes that depict the 3 types of rocks and 3 locomotive movements that depict the chemical/ physical changes that occur during the rock cycle that transform the rock into the next type. (ie. weathering, heat & pressure)
- Go over the **Choreography Planning Document** (see Downloads)

Part 2:

Small Group Planning:

- You may need to scaffold the planning of their dances by first having them create 3 body shapes for their 3 different rocks.
- Then have them create the locomotive movements that moves them into each new rock.

Part 3:

Sharing their Dances:

- Allow time for the small groups to create their “dance”.
- Groups will perform their dance pieces for the class.
- The students in the audience will observe and determine which body shapes represented which types of rock and also will look for the locomotive movements that represent the changes in nature.

REFLECTION

Reflective Strategies

Questions for Group Reflection:

- How did you know which body shape represented which rock?
- Did the movement choices that the group selected accurately depict the rock cycle?
- Are there any changes we might suggest these dancers make to their choreography to more effectively show the rock cycle?

OPTIONAL RESOURCES

- The Rock Cycle By Base 12 Innovations, Open iTunes to buy and download apps. Free Category: Education Updated: Apr 03, 2013 Version: 1.3 Size: 28.0 MB Language: English Seller: Sivaraman Sivaswami © 2011 Base 12 Innovations
- Rock Cycle - BrainPOP: <https://www.brainpop.com/science/earthsystem/rockcycle/>

APPENDIX (see Downloads)

- **Choreography Planning Document**

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