

# Rhode Island Unit

Title: Processes That Shape the Earth-Geology
Overall days: 15 days (45 minutes each session)
Discipline/Content Area Focus: Science
Grade Level: 5
Discipline Content: -Identify and describe the layers of the earth the rock cycle.
Processes: -Explain the properties of each layer of the earth. -Explain the properties of each layer of earth's atmosphere. -Use a variety of visuals to represent the rock cycle.
Essential Questions: 1. How does a diagram of the rock cycle explain how rocks can change over time? 2. How are the earth's layers different? 3. What are general characteristics of the earth's atmosphere? 4. How are the earth's atmospheric layers different?
<b>Written Curriculum</b>
Grade Level Expectations/Grade Span Expectations: <b>ESS 1</b> The Earth and earth materials as we know them today have developed over long periods of time, through continual change processes. <b>ESS1 (5-8) INQ+ POC –1</b> <i>Use geological evidence provided to support the idea that the Earth's crust/lithosphere is composed of plates that move.</i> <b>ESS1 (5-6)–1 Students demonstrate an understanding of processes and change over time within earth systems by ...</b> <b>1a</b> identifying and describing the layers of the earth. <b>ESS1 (5-8) SAE–2</b> <i>Explain the processes that cause the cycling of water into and out of the atmosphere and their connections to our planet's weather patterns.</i> <b>ESS1 (5-6)–2 Students demonstrate an understanding of processes and change over time within earth systems by ...</b> <b>ESS1 (5-8) INQ+ POC –5</b> <i>Using data about a rock's physical characteristics make and support an inference about the rock's history and connection to rock cycle.</i> <b>2d</b> identifying composition and layers of earth's atmosphere. <b>ESS1 (5-6)-5 Students demonstrate an understanding of processes and change over time by ...</b> <b>5a</b> representing the processes of the rock cycle in words, diagrams, or models. W—5—11.2 Sharing thoughts, observations, or impressions (Local) W—5—11.3 Generating topics for writing (Local) EXAMPLES: Journal writing, free writes, poetry, quick writes, scientific observations, learning logs, readers' writers' notebook, letters and personal notes, reading response journals W—5—1.2 Using the paragraph form: indenting, main idea, supporting details (Local)

- W-5-1.3 Recognizing organizational structures within paragraphs (Local)
- W-5-4 In written narratives, students organize and relate a story line/plot/series of events by..•
- W-5-4.1 Creating a clear and coherent (logically consistent) story line (Local)
- W-5-4.2 Establishing context (setting or background information), problem/conflict/challenge, and resolution (Local)
- W-5-4.3 Using transition words/phrases to establish clear chronology and to enhance meaning (Local)
- W-5-6 In informational writing (reports or procedures), students organize ideas/concepts by ..•
- W-5-6.1 Using an organizational text structure appropriate to focus/controlling idea (Local)

Notes, clarifications, and prerequisites regarding standards:

**Prior Learning:** Prior to grade 5, students have identified the four basic materials of the earth (water, soil, rocks, air). They have also sorted rocks, soils, and minerals to describe and compare physical properties (e.g., size, shape, color, texture, smell, weight, temperature, hardness, and composition). Students have also conducted investigations to describe how water moves rocks and different soils. They have identified sudden and gradual changes that affect the earth (e.g., floods, erosion caused by oceans). Students have investigated how wind, water, and ice have shaped and reshaped the land ( i.e., erosion, weathering).

**Current Learning:** In grade 5, students identify and describe the layers of the earth. They also identify the composition and layers of earth's atmosphere. Finally, students are introduced to the topic of the rock cycle. Be sure to introduce and review the terms *igneous, sedimentary, and metamorphic*. A review of weathering and erosion may be necessary to help explain the process of rock formation.

**Future Learning:** Because of the depth of these concepts, study of the rock cycle will continue in grade 6. Students will cite evidence to develop a logical argument to explain the formation of a rock, given its characteristics and location (e.g., classifying rock type using identification resources). In future years, students will cite evidence and develop a logical argument for plate movement using fossil evidence, layers of sedimentary rock, locations of mineral deposits, and shapes and continents. They will also plot the location of mountain ranges, earthquakes, and volcanoes to identify patterns. Students will eventually learn that heat affects the rock cycle. They will also learn about the physical and chemical processes of the earth that change the earth's crust.

Additional Learner Outcomes (not necessarily assessed):

### **Technology Skills**

1. **Creativity and Innovation-** Students demonstrate creative thinking, construct knowledge, and develop innovative products and processes using technology. Students
  - a. apply existing knowledge to generate new ideas, products, or processes
  - c. use models and simulations to explore complex systems and issues
2. **Communication and Collaboration-** Students use digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and to contribute to the learning of others. Students:
  - b. communicate information and ideas effectively to multiple audiences using a variety of media and formats
  - d. contribute to project teams to produce original works or solve problems
3. **Research and Information Fluency-** Students apply digital tools to gather, evaluate, and use information. Students:
  - b. locate, organize, analyze, evaluate, synthesize, and ethically use information from a variety of sources and media
  - c. evaluate and select information sources and digital tools based on the appropriateness to specific tasks
6. **Technology Operations and Concepts-** Students demonstrate a sound understanding of technology concepts, systems and operations. Students:
  - b. select and use applications effectively and productively
  - d. transfer current knowledge to learning of new technologies

### **21st Century Skills**

\*Critical Thinking

- \*Communication
- \*Collaboration
- \*Creativity

## Taught Curriculum

Instructional Sequence:

### Day 1

-In groups of 4, students create a KWL chart about rocks. ([graphic organizer](#)) Regroup as a class and make a master list.

-Show [Dr. Loopy Video](#) as an introduction to the Rock Cycle. Review the KWL Chart.

-What is the Rock Cycle?? Discuss with class. (Laptop, Elmo, Speakers)

-Introduce Vocabulary Words: sedimentary, metamorphic, and igneous. Students will record them in their notebooks.

**HW:** Classroom Blog : What is the difference between the three types of rocks- sedimentary, metamorphic, and igneous? [Kid Blog](#)

### Day 2

-Opening question: How can rocks change over time?? (Brainstorm in science notebooks)

-Vocabulary Words- erosion, weathering

-Experiment: Rock Cycle [Crayon experiment](#) Teacher will model the process of rock formation and the cycle

-Student Lab- [Chocolate Rock Cycle](#) In pairs, students will investigate the same process of creating the rock cycle by using chocolate. After making observations, they will share out conclusions

**HW:** Classroom Blog: Did you find that using chocolate was an effective way to represent the rock cycle? Why or why not? (provide details to support your answers) [Kid Blog](#)

### Day 3

-Warm-up activity Students will Cut and Paste Rock Cycle Vocabulary ([Activity](#))

-Using these vocabulary words, and your knowledge of the rock cycle, create a story titled “A Day in the Life of a Rock”. You must explain how you became the type of rock you choose, and put yourself on a journey through the process. Be sure to use your creativity and the 6 Traits of Writing!!! (Ipads, Laptops)

### Day 4

-Rock Cycle [Stations-Rock Cycle](#) Students will work in groups of 4 as they Journey through the Rock Cycle in stations (laptops, Ipads)

A. Analyze Rocks- What type of Rock Am I? Use (Flip-Camera to record accountable talk in groups)

B. Interactive web-sites [Rock Cycle](#)

C. Games

D. [Wordle](#)

E. Classify different types of rocks

**HW:** Classroom Blog: Which station did you like the best? Why? Explain how this particular station helped you to understand the process of the Rock Cycle. [Kid Blog](#)

### Day 5

-Opening question “What are the earth’s layers?”

-Introduce Vocabulary- Crust, Mantle, Core, Inner Core, and Outer Core. In pairs, they create flashcards for extra practice

-Show students a power-point of layers of the Earth

<http://education.nationalgeographic.com/education/encyclopedia/mantle/>

-Make a [Wordle](#) explaining the make-up of the earth (ipads)

### Day 6

- Begin with a video [Layers of the Earth](#)

-Students can create posters of the different layers in pairs and represent how they are different

### Day 7

-Opening question “What are the general characteristics of the earth’s atmosphere?”

Read E69 in 5th Grade Discovery Works Science Book

-Discuss characteristics of earth’s atmosphere. Students complete a worksheet labeling the different parts <http://www.enchantedlearning.com/subjects/astronomy/planets/earth/Atmosphere.shtml>

**HW:** Classroom Blog: Which atmospheric layer of the earth do we live in, and could we survive anywhere else? Why or why not? Cite evidence to explain your thinking. [Kid Blog](#)

**Day 8-11**

-Students will choose one of the four essential questions to analyze and present. With a partner, each pair will create a Powerpoint presentation to represent the answer to the question. (laptops or desktop computers)

**Day 12-13**

Power-Point Presentations (Laptop, Elmo, Speakers)

-Record in science notebooks- What did you learn today?

Follow-up questions from class members

**Day 14**

- Students work in pairs to construct a [Comic](#) to share new learned knowledge about the geology of the earth

-With the (Flip-Camera), students will record their partners reading the comic, and teacher will compose of the video’s and make a formal presentation to the class.

**Day 15**

-Assessment (vocabulary terms and essential questions)

Resources and Materials:


**Instructional Considerations:**

Key Vocabulary:

- |                   |             |
|-------------------|-------------|
| -Rock Cycle       | -Crust      |
| -Sedimentary Rock | -Mantle     |
| -Igneous Rock     | -Inner Core |
| -Metamorphic Rock | -Outer Core |
| -Erosion          | -Core       |
| -Weathering       | -Magma      |

Differentiation Strategies (for all student learners):

- Small group instruction, direct instruction, collaborative learning groups, “hands on” experiments, accountable talk, stations designed to accommodate all learners needs (kinesthetic, auditory, visual).
- Word wall displaying unit vocabulary with pictures for visuals
- Technology integration
- Flash cards for vocabulary, frequent check-ins. Games to review words
- Extra time on assignments will be given, if needed, as well as a “peer buddy” for extra clarification\

Depth of Knowledge: The tasks associated with this unit require higher level thinking and depth’s of knowledge because the students are asked to (1) Identify, Report, State, (2) Classify, Make Observations, (3)Cite Evidence, Investigate, Construct, (4) Design, Create, Analyze.

Institute for Learning (IFL) Strategies/Research Based Strategies: (See Instructional Sequence)

### **Accountable Talk**

- Students will actively participate in classroom talk
- Listen attentively
- Elaborate and build on other's ideas

### **Organizing for Effort**

- Clear and high expectations
- Curriculum geared towards standards

### **Academic Rigor in a Thinking Curriculum**

- Curriculum and instruction organized around major concepts
- Teaching and assessment focus on mastery of core concepts
- Students expected to raise questions, solve problems, reason
- Reflection on learning strategies
- Explanation and justification expected
- Test understanding by applying and discussing concepts

### **Self-management of Learning**

- Students create authentic products and performances for interested, critical audiences
- Finished work meets public standards of quality
- Learning strategies are modeled

### Teaching Strategies:

Day 1- Access prior knowledge and accompany with accountable talk- Groups of 4 (collaboration and direct instruction)

Day 2- Direct instruction/modeling experiment

Learning community- Groups of 4 to conduct experiment

Day 3- Independent learning- Creating a story, 1-1 with students for check-in

Day 4- Cooperative groups (Stations)

Day 5 and 6- Paired learning

Day 7- Independent learning after teacher direct instruction and discussion

Day 8-11- Paired learning and teacher check-in

Day 12- Whole Class

Day 13- Paired learning after teacher modeling

Day 14- Paired learning/ whole class

Day 15- Independent assessment

(All worksheets will be printed,or accessed through my WEEBLY)

### **Assessed Curriculum:**

#### Assessment Options

Embedded, Formative Assessments

- answers to teacher generated questions
- written responses to questions formal observations
- 
- blog responses
- successfully accessing and utilizing the classroom Weebly
- accountable talk

Summative/Unit Assessments

- Written responses to questions on classroom blog
- Powerpoint
- Lab reports
- Story “A Day in the Life of a Rock”
- Final Unit Assessment

Common Tasks

-Not Applicable

Benchmark Assessments

- Power-Point project ([Rubric](#))
- Wordle ([sample](#))
- Blogs ([sample](#))