GRADE 4– Unit 1: Earth Features & Processes

Mission Statement
The primary goal of the Swedesboro-Woolwich School District is to prepare each student with the real life skills needed to compete in a highly competitive global economy. This will be achieved by providing a comprehensive curriculum, the integration of technology, and the professional services of a competent and dedicated faculty, administration, and support staff. Guiding this mission will be Federal mandates, including No Child Left Behind, the New Jersey Core Curriculum Content Standards, and local initiatives addressing the individual needs of our students as determined by the Board of Education. The diverse resources of the school district, which includes a caring PTO and active adult community, contribute to a quality school system. They serve an integral role in supporting positive learning experiences that motivate, challenge and inspire children to learn.

Unit/Module Overview
In this unit, students investigate features and processes of the Earth's surface. Students explore the rapid process of volcanic eruptions! In contrast, students also explore the gradual Earth processes of weathering and erosion. Students apply their knowledge and design solutions to mitigate the impacts of these processes on humans.

Standards Covered in Current Unit/Module
Related Standards and Learning Goals
STANDARDS **SCI.4-ESS1-1** Identify evidence from patterns in rock formations and fossils in rock layers to support an explanation for changes in a landscape over time. **SCI.4-ESS2-1** Make observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation. **SCI.4-ESS2-2** Analyze and interpret data from maps to describe patterns of Earth's features. **SCI.4-ESS3-2** Generate and compare multiple solutions to reduce the impacts of natural Earth processes and climate change have on humans. **SCI.3-5-ETS1-2** Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem. **LEARNING GOALS**

Lesson 1: Volcanoes & Patterns of Earth's Features

I can analyze and interpret data from maps to describe patterns of the Earth's Surface.

Lesson 2: Volcanoes & Rock Cycle

I can explain the cause and effect of changes in a landscape over time and different rock formations / fossils in rock layers.

Lesson 3: Weathering & Erosion

I can explain the cause and effect between changes in rock / landscapes and the e effects of weathering or the rate of erosion by water, ice, wind, or vegetation.

Lesson 4: Sedimentary Rock & Fossils

I can explain how patterns in rock formations and fossils in rock layers show changes in a landscape over time.

Lesson 5: Erosion, Natural Hazards & Engineering

I can explain the cause of natural Earth processes / climate change and the effect they have on humans.

I can generate and compare solutions to a problem, the criteria and constraints of the problem.

Unit/Module Weekly Learning Activities and Pacing Guide			
Topic & # Days	**NJ Standards**	**Critical Knowledge & Skills**	**Possible Resources & Activities**
Week 1: Anchor Phenomenon: Fossil Finds	• 4-ESS1-1: *Identify evidence from patterns in rock formations and fossils in rock layers to support an explanation for changes in a landscape over time.* • 4-ESS2-1: *Make observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation* • 4-ESS2-2: *Analyze and interpret data from maps to describe patterns of Earth's features.*	**Obj. We are learning to**: • I can explain how patterns in rock formations and fossils in rock layers show changes in a landscape over time. **Suggested Formative Assessment(s)**: •	**Curriculum** ○ Mystery Science **Day 1:** -Introduction Slides -Class Discussion -Complete "Ashfall Fossil Beds Explanation" Worksheet **Day 2:** -Review Slides -Complete "See-Think-Wonder" Worksheet -Class Discussion **Materials** **Anchor Phenomenon: Fossil Finds** 1. Ashfall Fossil Beds Evidence Chart: Mystery Science Document #160 (will use throughout entire unit) 2. Ashfall Fossil Beds Evidence Chart Answer Key: Mystery Science Document #165 3. See-Think-Wonder Worksheet: Mystery Science Document #2301 4. The Birth of Rocks Teacher Guide: Mystery Science Document #142 5. Ashfall Fossil Beds Explanation: Mystery Science Document #151 6. Ashfall Fossil Beds Explanation Answer Key: Mystery Science Document #164

Week 2: Lesson 1: Volcanoes & Patterns of Earth's Features	• 4-ESS2-2: *Analyze and interpret data from maps to describe patterns of Earth's features.*	**Obj. We are learning to**: ● I can analyze and interpret data from maps to describe patterns of the Earth's Surface **Suggested Formative Assessment(s)**: **Lesson 1: Volcanoes & Patterns of Earth's Features** **Exit Ticket:** Mystery Science Document #302 **Answer Key:** Mystery Science Document #613	**Curriculum** ○ Mystery Science **Day 1:** -Introduction Video -Vocabulary Slides -Class Discussion **Days 2 & 3:** -Review Introduction / Vocabulary -Lab / Hands-on Activity **Day 4:** -Finish Video -Wrap up Discussions **Day 5:** -Assessment **Materials** **Lesson 1: Volcanoes & Patterns of Earth's Features** 1. Volcano Discoveries Worksheet: Mystery Science Document #45 2. Volcano Discoveries Answer Key: Mystery Science Document #283 3. Volcano Mapping Worksheet: Mystery Science Document #42 4. Volcano Mapping Answer Key: Mystery Science Document #435

			5. Colored Pencils or Crayons
Week 3: Lesson 2: Volcanoes & Rock Cycles	• 4-ESS1-1: *Identify evidence from patterns in rock formations and fossils in rock layers to support an explanation for changes in a landscape over time.*	**Obj. We are learning to**: ● I can explain the cause and effect of changes in a landscape over time and different rock formations / fossils in rock layers. **Suggested Formative Assessment(s)**: **Lesson 2: Volcanoes & Rock Cycle** Exit Ticket: Mystery Science Document #26 Answer Key: Mystery Science Document #614	**Curriculum** ○ Mystery Science **Day 1:** -Introduction Video -Vocabulary Slides -Class Discussion **Days 2 & 3:** -Review Introduction / Vocabulary -Lab / Hands-on Activity **Day 4:** -Finish Video -Wrap up Discussions **Day 5:** -Assessment **Materials** **Lesson 2: Volcanoes & Rock Cycle** 1. Lava Experiments Worksheet: Mystery Science Document #77 2. Lava Mat Printouts: Mystery Science Document #109 3. Table Coverings or Trash bags 4. Clear Plastic Cups 5. Flour 6. Measuring Cup 7. Paper Plates 8. Plastic Spoons 9. Plastic Straws 10. Gallon Ziploc Bags
Week 4: Lesson 3: Weathering & Erosion	• 4-ESS2-1: *Make observations and/or measurements to provide evidence of the effects of weathering or the rate of*	**Obj. We are learning to**: ● I can explain the cause and effect between changes in rock / landscapes and the e effects of weathering or the rate of erosion	**Curriculum** ○ Mystery Science **Day 1:** -Introduction Video

	erosion by water, ice, wind, or vegetation	by water, ice, wind, or vegetation. **Suggested Formative Assessment(s)**: **Lesson 3: Weathering & Erosion** Exit Ticket: Mystery Science Document #221 Answer Key: Mystery Science Document #441	-Vocabulary Slides -Class Discussion **Days 2 & 3:** -Review Introduction / Vocabulary -Lab / Hands-on Activity **Day 4:** -Finish Video -Wrap up Discussions **Day 5:** -Assessment **Materials** **Lesson 3: Weathering & Erosion** 1. Sugar Shake Data Worksheet: Mystery Science Document #21 2. Markers 3. Paper Plates 4. Plastic Containers w/ Lids 5. Sugar Cubes
Week 5: Lesson 4: Sedimentary Rock & Fossils	• 4-ESS1-1: *Identify evidence from patterns in rock formations and fossils in rock layers to support an explanation for changes in a landscape over time.*	**Obj. We are learning to**: ● I can explain how patterns in rock formations and fossils in rock layers show changes in a landscape over time. **Suggested Formative Assessment(s)**: **Lesson 4: Sedimentary Rock & Fossils** Exit Ticket: Mystery Science Document #25296 Answer Key: Mystery Science Document #25297	**Curriculum** ○ Mystery Science **Day 1:** -Introduction Video -Vocabulary Slides -Class Discussion **Days 2 & 3:** -Review Introduction / Vocabulary -Lab / Hands-on Activity **Day 4:** -Finish Video -Wrap up Discussions **Day 5:** -Assessment **Materials**

			Lesson 4: Sedimentary Rock & Fossils 1. Colossal Canyon Printouts: Mystery Science Document #25023 2. Colossal Canyon Answer Key: Mystery Science Document #25026 3. Fossil Cards Printouts: Mystery Science Document #25024 4. Glue Sticks 5. Scissors
Week 6: Lesson 5: Erosion, Natural Hazards & Engineering	**4-ESS3-2:** ***Generate and compare multiple solutions to reduce the impacts of natural Earth processes on humans.*** **3-5-ETS1-2:** ***Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.***	**Obj. We are learning to**: ● I can explain the cause of natural Earth processes / climate change and the effect they have on humans. ● I can generate and compare solutions to a problem the criteria and constraints of the problem. **Suggested Formative Assessment(s)**: **Lesson 5: Erosion, Natural Hazards & Engineering** Exit Ticket: Mystery Science Document #196 Answer Key: Mystery Science Document #477	**Curriculum** ○ Mystery Science **Day 1:** -Introduction Video -Vocabulary Slides -Class Discussion **Days 2 & 3:** -Review Introduction / Vocabulary -Lab / Hands-on Activity **Day 4:** -Finish Video -Wrap up Discussions **Day 5:** -Assessment **Materials** **Lesson 5: Erosion, Natural Hazards & Engineering** 1. Save My Slide-City Home Worksheet: Mystery Science Document #122 2. Post-it Notes
Week 7: Unit Review & Summative	• 4-ESS1-1: *Identify evidence from patterns in rock formations and fossils in rock layers to support an*	**Obj. We are learning to**: ● I can investigate features and processes of the Earth's surface. ● I can analyze and interpret data from maps	**Curriculum** ○ Mystery Science **Day 1-2** -Review Units

Assessment	*explanation for changes in a landscape over time.* • 4-ESS2-1: *Make observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation* • 4-ESS2-2: *Analyze and interpret data from maps to describe patterns of Earth's features.* **4-ESS3-2: *Generate and compare multiple solutions to reduce the impacts of natural Earth processes on humans.*** **3-5-ETS1-2: *Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.***	to describe patterns of the Earth's Surface ● I can explain the cause and effect of changes in a landscape over time and different rock formations / fossils in rock layers. ● I can explain the cause and effect between changes in rock / landscapes and the e effects of weathering or the rate of erosion by water, ice, wind, or vegetation. **Suggested Formative Assessment(s)**: **Unit 1: The Birth of Rocks - Earth's Processes & Features** Summative Assessment: Mystery Science Document #2270 Answer Key: Mystery Science Document #2271	**Days 3-4:** -Summative Assessment **Materials**
Week 8: Performance Task: Rocks & Earth's Surface	• 4-ESS1-1: *Identify evidence from patterns in rock formations and fossils in rock layers to support an explanation for changes in a landscape over time.* • 4-ESS2-1: *Make observations and/or measurements to provide evidence of the effects*	**Obj. We are learning to**: ● In this performance task, students will analyze four rocks and the maps and photos from different locations to determine where each rock was found. They will support each of their claims with evidence. **Suggested Formative Assessment(s)**: **Performance Task: Rocks & Earth's Surface**	**Curriculum** ○ Mystery Science **Days 1-5:** -Complete Performance Task as needed -Enrichment opportunities through Mystery Science Mini Lessons: Why is there sand at the beach? (mysteryscience.com) **Materials** **Performance Task: Rocks & Earth's Surface**

	of weathering or the rate of erosion by water, ice, wind, or vegetation • 4-ESS2-2: *Analyze and interpret data from maps to describe patterns of Earth's features.*	Story of a Rock Worksheet: Mystery Science Document #252 Story of a Rock Answer Key: Mystery Science Document #255 Story of a Rock Rubric: Mystery Science Document #254	Story of a Rock Worksheet: Mystery Science Document #252 Story of a Rock Answer Key: Mystery Science Document #255 Story of a Rock Rubric: Mystery Science Document #254

Mystery Science Google Forms Assessments:

Google Form Versions of Mystery Science Assessments

Link to Additional Components including Cross Curricular Connections, Accommodations, Assessments, Etc

ELA Enduring Understanding Statements