Unit 1: Pebbles, Sand and Silt

Content Area: **Science**
Course(s):
Time Period: **Trimester 1**
Length: **10-12 Weeks**
Status: **Published**

Summary

In this unit, students will discover materials that cover the Earth's surface. They observe the properties of rocks of various sizes and study the components of soil, study the results of weathering and erosion, locate natural sources of water, and determine how to represent the shapes and kinds of land and bodies of water on Earth. Students use simple tools to observe, describe, analyze, and sort solid earth materials and learn how the properties of the materials are suited to different purposes. Students explore how wind and water change the shape of the land and compare ways to slow the process of erosion. Students learn about the important role that earth materials have as natural resources.

Revision Date: July 2020

Standards

9.4.2.CI	Creativity and Innovation
9.1.2.CAP	Career Awareness and Planning
K-2-ETS1	Engineering Design
2-PS1	Matter and Its Interactions
	Different types of jobs require different knowledge and skills.
2-PS1-1	Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties.
K-2-ETS1-1	Ask questions, make observations, and gather information about a situation people want to change (e.g., climate change) to define a simple problem that can be solved through the development of a new or improved object or tool.
9.1.2.CAP.1	Make a list of different types of jobs and describe the skills associated with each job.
9.4.2.CT	Critical Thinking and Problem-solving
PS1.A	Structure and Properties of Matter
ETS1.A	Defining and Delimiting Engineering Problems
2-PS1-2	Analyze data obtained from testing different materials to determine which materials have the properties that are best suited for an intended purpose.
K-2-ETS1-2	Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.
ETS1.B	Developing Possible Solutions
LA.RI.2.1	Ask and answer such questions as who, what, where, when, why, and how to demonstrate understanding of key details in a text.

LA.RI.2.2	Identify the main topic of a multiparagraph text as well as the focus of specific paragraphs within the text.
K-2-ETS1-3	Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.
LA.RI.2.3	Describe the connection between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text.
2-PS1-3	Make observations to construct an evidence-based account of how an object made of a small set of pieces can be disassembled and made into a new object.
ETS1.C	Optimizing the Design Solution
LA.RI.2.7	Explain how specific illustrations and images (e.g., a diagram showing how a machine works) contribute to and clarify a text.
PS1.A	Structure and Properties of Matter
LA.RI.2.8	Describe and identify the logical connections of how reasons support specific points the author makes in a text.
LA.RI.2.9	Compare and contrast the most important points presented by two texts on the same topic.
LA.RI.2.10	Read and comprehend informational texts, including history/social studies, science, and technical texts, at grade level text complexity proficiently with scaffolding as needed.
2-PS1-4	Construct an argument with evidence that some changes caused by heating or cooling can be reversed and some cannot.
9.4.2.TL.6	Illustrate and communicate ideas and stories using multiple digital tools (e.g., SL.2.5.).
9.4.2.TL.7	Describe the benefits of collaborating with others to complete digital tasks or develop digital artifacts (e.g., W.2.6., 8.2.2.ED.2).
2-ESS1-1	Use information from several sources to provide evidence that Earth events can occur quickly or slowly.
ESS1.C	The History of Planet Earth
2-ESS2-1	Compare multiple solutions designed to slow or prevent wind or water from changing the shape of the land.
ESS2.A	Earth Materials and Systems
ETS1.C	Optimizing the Design Solution
2-ESS2-2	Develop a model to represent the shapes and kinds of land and bodies of water in an area.
ESS2.B	Plate Tectonics and Large-Scale System Interactions
2-ESS2-3	Obtain information to identify where water is found on Earth and that it can be solid or liquid.
ESS2.C	The Roles of Water in Earth's Surface Processes
CRP.K-12.CRP1.1	Career-ready individuals understand the obligations and responsibilities of being a member of a community, and they demonstrate this understanding every day through their interactions with others. They are conscientious of the impacts of their decisions on others and the environment around them. They think about the near-term and long-term consequences of their actions and seek to act in ways that contribute to the betterment of their teams, families, community and workplace. They are reliable and consistent in going beyond the minimum expectation and in participating in activities that serve the greater good.
CRP.K-12.CRP2.1	Career-ready individuals readily access and use the knowledge and skills acquired through experience and education to be more productive. They make connections between abstract concepts with real-world applications, and they make correct insights about when it is appropriate to apply the use of an academic skill in a workplace situation.

CRP.K-12.CRP4.1	Career-ready individuals communicate thoughts, ideas, and action plans with clarity, whether using written, verbal, and/or visual methods. They communicate in the workplace with clarity and purpose to make maximum use of their own and others' time. They are excellent writers; they master conventions, word choice, and organization, and use effective tone and presentation skills to articulate ideas. They are skilled at interacting with others; they are active listeners and speak clearly and with purpose. Career-ready individuals think about the audience for their communication and prepare accordingly to ensure the desired outcome.
CRP.K-12.CRP5.1	Career-ready individuals understand the interrelated nature of their actions and regularly make decisions that positively impact and/or mitigate negative impact on other people, organization, and the environment. They are aware of and utilize new technologies, understandings, procedures, materials, and regulations affecting the nature of their work as it relates to the impact on the social condition, the environment and the profitability of the organization.
CRP.K-12.CRP6.1	Career-ready individuals regularly think of ideas that solve problems in new and different ways, and they contribute those ideas in a useful and productive manner to improve their organization. They can consider unconventional ideas and suggestions as solutions to issues, tasks or problems, and they discern which ideas and suggestions will add greatest value. They seek new methods, practices, and ideas from a variety of sources and seek to apply those ideas to their own workplace. They take action on their ideas and understand how to bring innovation to an organization.
CRP.K-12.CRP7.1	Career-ready individuals are discerning in accepting and using new information to make decisions, change practices or inform strategies. They use reliable research process to search for new information. They evaluate the validity of sources when considering the use and adoption of external information or practices in their workplace situation.
CRP.K-12.CRP8.1	Career-ready individuals readily recognize problems in the workplace, understand the nature of the problem, and devise effective plans to solve the problem. They are aware of problems when they occur and take action quickly to address the problem; they thoughtfully investigate the root cause of the problem prior to introducing solutions. They carefully consider the options to solve the problem. Once a solution is agreed upon, they follow through to ensure the problem is solved, whether through their own actions or the actions of others.
TECH.8.1.2.A	Technology Operations and Concepts: Students demonstrate a sound understanding of technology concepts, systems and operations
TECH.8.1.2.C	Communication and Collaboration: Students use digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others.
TECH.8.1.2.E	Research and Information Fluency: Students apply digital tools to gather, evaluate, and use information.

Essential Questions/Enduring Understandings

- How can we represent the shapes and kinds of land and bodies of water in an area?
- How do they interact and change?
- In what ways do humans slow or prevent wind or water from changing the shape of the land?
- What are the properties of earth materials?
- What evidence proves that Earth events can occur quickly or slowly?
- Where can we find water?

Objectives

Students will know…..

- How wind and water can change the shape of land
- How fencing and dunes are design solutions to slow or prevent land change
- Some events in Earth's history happen quickly, others occur slowly over time
- Rocks are not all the same
- Rocks are a resource that are naturally occuring
- How to organize and categorize rocks by their properties
- Rock is hard but susceptible to weathering
- How sand is formed
- How to compare and contrast landform changes
- How people use Earth materials to construct objects
- Different ways to represent landforms and bodies of water
- Patterns in the natural world can be observed

Students will be skilled at…..

- Asking questions and defining problems
- Developing and using models
- Planning and carrying out investigations
- Analyzing and interpreting data
- Using mathematics and computational thinking
- Constructing explanations and designing solutions
- Engaging in argument from evidence
- Obtaining, evaluating and communicating information

Learning Plan

- Preview the essential questions and connect learning throughout the unit.
- Gain students understanding and prior knowledge of rock and landforms
- Read literature on types of landforms and rock
- Sort pictures of rock types
- Create charts on landforms
- Utilize FOSS kit with materials: Pebbles, Sand, and Silt
- Organize class rock collection
- Students observe, describe, and sort rocks according to their properties
- Students discover solid objects in the schoolyard environment, and sort the found objects into natural and human-made.
- Experiment with sand to create silt and clay
- Introduce vocabulary pertinent to rock and landforms
- Make rubbings from sandpaper, sculptures from sand, jewelry from clay, and bricks from soil
- Students go to a schoolyard trip to look for naturally occurring Earth material
- Students read about sources of natural water, sort images of water sources
- Discuss where water is found in their community

- Compare different solutions to slow the effects of wind and water erosion
- Discuss different ways to represent landforms and bodies of water
- Maintain observational journals with student note taking and drawings of experiments and activities
- Incorporate literature on rock and landforms through shared reading, big books, and nonfiction books from classroom libraries

Assessment

Science courses are designed to promote skill attainment. Student progression and pace through which they proceed through the performance tasks is based on their affinity for and ability to reach skill attainment. The teacher will determine formative and summative skill attainment; alternative assessments will be incorporated for each student based on their strengths and challenges.

Formative Assessments: Teacher observation, student responses during lessons,

Summative Assessments: Foss investigation checklists, science notebook

Benchmark Assessments: Investigation IChecks, science notebook

- Investigation 1.1: Icheck and FQ- What happens when rocks rub together?
- Investigation 1.2: Icheck and FQ- What happens when rocks are placed in water?
- Investigation 1.3: Icheck and FQ- How are river rocks the same?
- Investigation 2.1: Icheck and FQ- How can rocks be separated by size?
- Investigation 2.3: Icheck and FQ- Is there an Earth material smaller than sand?
- Investigation 3.1: Icheck and FQ- How do people use Earth materials?
- Investigation 3.2: Icheck and FQ- What does sand do for sandpaper?
- Investigation 3.3: Icheck and FQ- How can we make sand a sculpture?
- Investigation 4.1:Icheck and FQ- What is soil?
- Investigation 4.2: Icheck and FQ- How do soils differ?

Alternative Assessments: Oral presentations, student produced projects

Materials

Core Book List
FOSS Kit: Pebbles, Sand, and Silt and materials for experimentation and exploration
BrainPop Junior

Discovery Education
Mystery Doug
PebbleGo
Science notebook for assessment and journaling
Science spin, weekly reader magazine if applicable
F&P Shared Reading Books:

- Weather Watch Rita's Journey (Hybrid- F/NF)
- A Raindrop's Journey

F&P Interactive Read Alouds:

- A Log's Life
- River Story
- Volcano Rising
- On Earth