Unit 02: Work of Water: Erosion & Earth's Surface

Content Area: **Template**
Course(s):
Time Period: **Full Year**
Length: **FY**
Status: **Published**

Standards Alignment

New Jersey Student Learning Standards

ESS1: Earth's Place in the Universe
ESS1.C: The History of Planet Earth

Some events happen very quickly; others occur very slowly,over a time period much longer than one can observe. (2-ESS1-1)

ESS2: Earth's Systems
ESS2.A: Earth Materials and Systems

Wind and water can change the shape of the land. (2-ESS2-1)

ESS2.B: Plate Tectonics and Large-Scale System Interactions

Maps show where things are located. One can map the shapes and kinds of land and water in any area. (2-ESS2-2)

ESS2.C: The Roles of Water in Earth's Surface Processes

Water is found in the ocean,rivers, lakes, and ponds. Water exists as solid ice and in liquid form. (2-ESS2-3)

ETS1: Engineering Design
ETS1.A: Defining and Delimiting an Engineering Problem

A situation that people want to change or create can be approached as a problem to be solved through engineering. Such problems may have many acceptable solutions. (K-2-ETS1- 1) (secondary to KPS2-2)

Asking questions, making observations, and gathering information are helpful in thinking about problems. (K-2-ETS1-1) (secondary to K-ESS3-2)

Before beginning to design a solution, it is important to clearly understand the problem. (K-2-ETS1-1)

ETS1.B: Developing Possible Solutions

Designs can be conveyed through sketches, drawings, or physical models. These representations are useful in communicating ideas for a problem's solutions to other people. (K-2-ETS1-1) (secondary to K-ESS3-3) (secondary to 2-LS2-2)

ETS1.C: Optimizing the Design Solution

Because there is always more than one possible solution to a problem, it is useful to compare and test designs. (K-2-ETS1-1) (secondary to 2-ESS2-1)

SCI.2.ESS1.C	The History of Planet Earth
SCI.2-ESS2	Earth's Systems
SCI.2.ESS2.A	Earth Materials and Systems
SCI.2.ETS1.C	Optimizing the Design Solution
SCI.2.ESS2.B	Plate Tectonics and Large-Scale System Interactions
SCI.2.ESS2.C	The Roles of Water in Earth's Surface Processes
1-ESS1	Earth's Place in the Universe
2-ESS2-3	Obtain information to identify where water is found on Earth and that it can be solid or liquid.
2-ESS2-2	Develop a model to represent the shapes and kinds of land and bodies of water in an area.
2-ESS2-1	Compare multiple solutions designed to slow or prevent wind or water from changing the shape of the land.
2-ESS2	Earth's Systems
2-ESS1	Earth's Place in the Universe
2-ESS1-1	Use information from several sources to provide evidence that Earth events can occur quickly or slowly.
K-2-ETS1	Engineering Design
K-2-ETS1-1.ETS1.A	Defining and Delimiting Engineering Problems

Integration of Career Readiness, Life Literacies and Key Skills

CRP.K-12.CRP1	Act as a responsible and contributing citizen and employee.
CRP.K-12.CRP2	Apply appropriate academic and technical skills.
CRP.K-12.CRP3	Attend to personal health and financial well-being.
CRP.K-12.CRP4	Communicate clearly and effectively and with reason.
CRP.K-12.CRP5	Consider the environmental, social and economic impacts of decisions.
CRP.K-12.CRP6	Demonstrate creativity and innovation.
CRP.K-12.CRP7	Employ valid and reliable research strategies.
CRP.K-12.CRP8	Utilize critical thinking to make sense of problems and persevere in solving them.
CRP.K-12.CRP9	Model integrity, ethical leadership and effective management.
CRP.K-12.CRP10	Plan education and career paths aligned to personal goals.
CRP.K-12.CRP11	Use technology to enhance productivity.
CRP.K-12.CRP12	Work productively in teams while using cultural global competence.

Technology / Integration of Computer Science and Design Thinking

TECH.8.1.2	Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.
TECH.8.1.2.E	Research and Information Fluency: Students apply digital tools to gather, evaluate, and use information.

TECH.8.1.2.E.1	Use digital tools and online resources to explore a problem or issue.
TECH.8.2.2	Technology Education, Engineering, Design, and Computational Thinking - Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.
TECH.8.2.2.A	The Nature of Technology: Creativity and Innovation: Technology systems impact every aspect of the world in which we live.
TECH.8.2.2.A.1	Define products produced as a result of technology or of nature.
TECH.8.2.2.A.5	Collaborate to design a solution to a problem affecting the community.
TECH.8.2.2.B	Technology and Society: Knowledge and understanding of human, cultural and society values are fundamental when designing technology systems and products in the global society.
TECH.8.2.2.B.1	Identify how technology impacts or improves life.
TECH.8.2.2.C	Design: The design process is a systematic approach to solving problems.
TECH.8.2.2.C.1	Brainstorm ideas on how to solve a problem or build a product.
TECH.8.2.2.C.2	Create a drawing of a product or device that communicates its function to peers and discuss.

Interdisciplinary Connections: NJSLS for ELA, Social Studies, Science and/or Math Section

	Key Ideas and Details
LA.K-12.NJSLSA.R1	Read closely to determine what the text says explicitly and to make logical inferences and relevant connections from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.
	Craft and Structure
LA.K-12.NJSLSA.R4	Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone.
	Integration of Knowledge and Ideas
LA.K-12.NJSLSA.R7	Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words.
LA.RI.2	Reading Informational Text
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.K-12.NJSLSA.W	Writing
	Craft and Structure
LA.RI.2.4	Determine the meaning of words and phrases in a text relevant to a grade 2 topic or subject area.
LA.K-12.NJSLSA.W2	Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.
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.
LA.K-12.NJSLSA.SL	Speaking and Listening

	Comprehension and Collaboration
LA.K-12.NJSLSA.SL1	Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.
LA.W.2.2	Write informative/explanatory texts in which they introduce a topic, use evidence-based facts and definitions to develop points, and provide a conclusion.
LA.SL.2.1	Participate in collaborative conversations with diverse partners about grade 2 topics and texts with peers and adults in small and larger groups.
LA.SL.2.1.A	Follow agreed-upon norms for discussions (e.g., gaining the floor in respectful ways, listening to others with care, speaking one at a time about the topics and texts under discussion).
LA.SL.2.1.B	Build on others' talk in conversations by linking their explicit comments to the remarks of others.
LA.SL.2.1.C	Ask for clarification and further explanation as needed about the topics and texts under discussion.

Integration of Diversity, Equity and Inclusion; Climate Change; Informational and Media LiteracyNew Section

see Crosswalks

21st Century Life and Careers

Stage I: Desired Results

Transfer/Overview/Rationale

Transfer / Overview / Rationale

Unit Rationale

The purpose of this unit…

Students develop the idea that water is a powerful force that reshapes the earth's surface.

Meaning

Essential Questions

Essential Questions

If you floated down a river, where would you end up?

Why is there sand at the beach?

What is strong enough to make a canyon?

How can you stop a landslide?

Enduring Understanding/Indicators of Understanding

Enduring Understanding/Indicators of Understanding

1. Rivers begin at points of high land, flow to points of low land, and then into the ocean.
2. As rivers flow toward the ocean, rocks collide into one another causing them to break into smaller pieces aka sand.
3. Water is powerful enough to move the earth's surface.
4. Heavy rains wash away dirt and rocks, creating canyons - this process is called erosion.
5. Landslides are when the earth loosens and is washed away down a hill. This is more likely to happen after a wildfire

Acquisition (Student Learning Objectives)

Knowledge

Knowledge

Students will know…

- Water is powerful enough to transform land
- Sand is created by broken rocks and stone that traveled to oceans through rivers
- Rivers flow from mountains to oceans
- Canyons are created by the movement of rushing water
- Landslides are a form of erosion
- Wildfires dry out land, which causes erosion to have a larger effect
- There are many ways we can help prevent erosion and landslides

Skills

Skills

Student will be skilled at …

- explaining how rivers flow
- identifying the beginning and end of a river
- modeling how rocks travel and break apart
- explaining why sand is at the beach
- understanding effects of heavy rain
- designing solutions to stabilize soil and prevent landslides
- defining a problem
- conducting investigations
- developing a model
- arguing evidence

Stage 3: Learning Plan

Resource and Mentor Texts

Resources and Mentor Texts

www.mysteryscience.com

www.brainpop.com

Mentor Text/Read Alouds

Hiscock, B. (1999). The big rock.

Ewart, C. (2014). Fossil.

Meierhenry, M. (2007). The mystery of the round rocks.

Herman, J. (1996). The magic school bus blows its top: A book about volcanoes.

Smith, P. (2015). How do wind and water change Earth?

Hyde, N. (2010). Soil erosion and how to prevent it.

Koontz, R. (2006). Erosion: Changing Earth's surface.

Dorros, A. (2000). Follow the water from brook to ocean.

Locker, T. (2002). Water dance.

Smith, P. (2015). Earth's landforms and bodies of water.

Lobel, A. (1993). Ming Lo moves the mountain.

Lyon, G. (2011). All the water in the world.

Kerley, B. (2006). A cool drink of water.

Paul, M. (2015). Water is water: A book about the water cycle.

Rosinsky, N. (2002). Water: Up, down, and all around.

Notebook Section Cover

Formative Assessment Strategies

Formative Assessment Strategies

- Participation in class discussions (thumbs up, thumbs down, turn & talk)
- Science notebooks
- Written responses to discussion questions within each mystery
- Teacher observation during discussion groups
- Prepared written quizzes
- Exit Tickets
- Content check-ins using Kahoot, Nearpod, Quizizz
- Graphic Organizers

Learning Activities/Unit of Study

Learning Activities/Unit of Study

Lesson Structure:

- Connection
- Teach (text/video/lecture)
- Active Engagement (discussion groups, labs/learning activity, whole class discussion, independent activity, research)

The learning activities for this unit are directly linked to Mystery Science. The attachments provided are the lesson plans for each mystery. All worksheets and materials for each mystery are provided via link to Mystery Science within each lesson plan.

Water - Mystery1

Water - Mystery2

Water - Mystery3

Water - Mystery4

Modifications and/or Accommodations

Suggested Modifications (ELL, Sp. Ed, GIfted, At-risk of Failure)

English Language Learners

Native language support: The teacher provides auditory or written content to students in their native language.

Adjusted Speech: The teacher changes speech patterns to increase student comprehension. This could include facing the students, paraphrasing, clearly indicating the most important ideas, and speaking more slowly.

Visuals: The teacher uses graphics, pictures, visuals, and manipulatives. This helps ELL students better understand and comprehend the subjects at hand.

Front-Loading Vocabulary: The teacher front loads vocabulary. This means providing students with a list of important vocabulary words they will need to know for a book, lesson, etc. prior to the lesson being taught. Including pictures to go with the vocabulary words is also very beneficial for the students.

Special Education Students

Chunking: The teacher presents information in a way that makes it easy for students to understand and remember. Chunking is based on the presumption that our working memory is easily overloaded by excessive detail. The best way to deliver information is to organize it into meaningful units. Because students with special needs get overloaded easily, chunking is an effective strategy to use with them.

Checking for Understanding: It is important to constantly check for understanding, especially for students who have accommodations. Teachers want to make sure students understand the concepts being covered in a way that makes sense to them.

Extra time: The teacher provides students with special needs extra time to complete work or answer questions. It is important to give students enough time to process their thoughts.

Oral Reading: The teacher will read work orally to students. Class work such as tests and literature circles may need to be read aloud to the student.

Timers: The teacher will use timers as an instructional tool. The use of timers is beneficial for students who have trouble completing tasks. Timers can be helpful so the student is aware of how much time they have to complete an assignment.

Students with 504 Plans

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Gifted & Talented Strategies

Extensions/Enrichments: Teachers will provide gifted and talented students with extension/enrichment projects. Students will be challenged to further their understanding, to apply acquired knowledge, and/or to produce something in reference to acquired knowledge.

Modify/Change Activities: Teachers will monitor and modify activities to accommodate those students who need to be challenged further. Additional reading, problem-solving, writing, or project work is necessary for those students who are ready to move on at a rate more accelerated than their peers. In this way, G & T students are provided the same opportunity for support as special needs students.

Students at Risk of School Failure

Directions or Instructions: Make sure directions and/or instructions are given in limited numbers. Give directions/instructions verbally and in simple written format. Ask students to repeat the instructions or directions to ensure understanding occurs. Check back with the student to ensure he/she hasn't forgotten.

Peer Support: Peers can help build confidence in other students by assisting in peer learning. Many teachers use the 'ask 3 before me' approach. This is fine, however, a student at risk may have to have a specific student or two to ask. Set this up for the student so he/she knows who to ask for

clarification before going to you.

Alternate or Modified Assignments: Always ask yourself, "How can I modify this assignment to ensure the students at risk are able to complete it?" Sometimes you'll simplify the task, reduce the length of the assignment or allow for a different mode of delivery. For instance, many students may hand something in, the at-risk student may jot notes and give you the information verbally. Or, it just may be that you will need to assign an alternate assignment.

Increase One to One Time: When other students are working, always touch base with your students at risk and find out if they're on track or needing some additional support. A few minutes here and there will go a long way to intervene as the need presents itself.

Contracts: It helps to have a working contract between you and your students at risk. This helps prioritize the tasks that need to be done and ensure completion happens. Each day write down what needs to be completed, as the tasks are done, provide a checkmark or happy face. The goal of using contracts is to eventually have the student come to you for completion sign-offs.

Hands On: As much as possible, think in concrete terms and provide hands-on tasks. This means a child doing math may require a calculator or counters. The child may need to tape record comprehension activities instead of writing them. A child may have to listen to a story being read instead of reading it him/herself.

Tests/Assessments: Tests can be done orally if need be. Break tests down in smaller increments by having a portion of the test in the morning, another portion after lunch and the final part the next day.

Seating: Seat students near a helping peer or with quick access to the teacher. Those with hearing or sight issues need to be close to the instruction which often means near the front.