

| Unit Overview   |   |
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| <b>Content Area: Earth and Space Science</b>  |   |
| <b>Unit Title: The Earth’s Land and Water</b>   | <b>Unit: 1</b>  |
| <b>Target Course/Grade Level: 2</b>   | <b>Timeline: 28 days</b>  |
| <p><b>Unit Summary:</b></p> <p style="text-align: center;"><b>Where do we find water?</b></p> <p>In this unit of study, students use information and models to identify and represent the shapes and kinds of land and bodies of water in an area and where water is found on Earth. The crosscutting concept of patterns is called out as an organizing concept for these disciplinary core ideas. Students demonstrate grade-appropriate proficiency in developing and using models and obtaining, evaluating, and communicating information. Students are also expected to use these practices to demonstrate an understanding of the core ideas.</p> <p>This unit is based on 2-ESS2-3 and 2-ESS2-2.</p> <p style="text-align: center;"><b>In what ways do humans slow or prevent wind or water from changing the shape of the land?</b></p> <p>In this unit of study, students apply their understanding of the idea that wind and water can change the shape of land to compare design solutions to slow or prevent such change. The crosscutting concepts of stability and change; structure and function; and the influence of engineering, technology, and science on society and the natural world are called out as organizing concepts for these disciplinary core ideas. Students demonstrate grade-appropriate proficiency in asking questions and defining problems, developing and using models, and constructing explanations and designing solutions. Students are also expected to use these practices to demonstrate an understanding of the core ideas.</p> <p>This unit is based on 2-ESS1-1, 2-ESS2-1, K-2-ETS1-1, and K-2-ETS1-2.</p> |   |
| Learning Targets  |   |
| <b>NJSLS-Science</b>  |   |
| 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-ESS1-1  | Use information from several sources to provide evidence that Earth events can occur quickly or slowly. |

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| 2-ESS2-1   | Compare multiple solutions designed to slow or prevent wind or water from changing the shape of the land.   |
| K-2-ETS-1  | Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool. |
| 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.  |

**Disciplinary Core Ideas**

**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)

**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)

**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.A: Earth Materials and Systems**

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

**ETS1.A: Defining and Delimiting Engineering Problems**

- A situation that people want to change or create can be approached as a problem to be solved through engineering. (K-2-ETS1-1)
- Asking questions, making observations, and gathering information are helpful in thinking about problems. (K-2-ETS1-1)
- 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-ETS1-2)

## Science and Engineering Practices

### Obtaining, Evaluating, and Communicating Information

- Obtain information using various texts, text features (e.g., headings, tables of contents, glossaries, electronic menus, icons), and other media that will be useful in answering a scientific question. (2-ESS2-3)

### Developing and Using Models

- Develop a model to represent patterns in the natural world. (2-ESS2-2)

## NJSLS Connections

### Primary Interdisciplinary Connections:

#### English Language Arts/Literacy:

With guidance and support from adults, use a variety of digital tools to produce and publish writing, including in collaboration with peers. (2-ESS2-3) W.2.6

Recall information from experiences or gather information from provided sources to answer a question. (2-ESS2-3) W.2.8

Create audio recordings of stories or poems; add drawings or other visual displays to stories or recounts of experiences when appropriate to clarify ideas, thoughts, and feelings. (2-ESS2-2) SL.2.5

Ask and answer such questions as who, what, where, when, why, and how to demonstrate understanding of key details in a text. (2-ESS1-1), (K-2-ETS1-1) RI.2.1

Describe the connection between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text. (2-ESS1-1) RI.2.3

With guidance and support from adults, use a variety of digital tools to produce and publish writing, including in collaboration with peers. (2-ESS1-1), (K-2-ETS1-1) W.2.6

Participate in shared research and writing projects (e.g., read a number of books on a single topic to produce a report; record science observations). (2-ESS1-1) W.2.7

Recall information from experiences or gather information from provided sources to answer a question. (2-ESS1-1), (K-2-ETS1-1) W.2.8

Recount or describe key ideas or details from a text read aloud or information presented orally or through other media. (2-ESS1-1) SL.2.2

Describe the connection between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text. (2-ESS2-1) RI.2.3

Create audio recordings of stories or poems; add drawings or other visual displays to stories or recounts of experiences when appropriate to clarify ideas, thoughts, and feelings. (K-2-ETS1-2) SL.2.5

Compare and contrast the most important points presented by two texts on the same topic. (2-ESS2-1) RI.2.9

#### Mathematics:

Reason abstractly and quantitatively. (2-ESS2-2) MP.2

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| <p>Model with mathematics. (2-ESS2-2) MP.4</p> <p>Read and write numbers to 1000 using base-ten numerals, number names, and expanded form. (2-ESS2-2) 2.NBT.A.3</p> <p>Use addition and subtraction within 100 to solve word problems involving lengths that are given in the same units, e.g., by using drawings (such as drawings of rulers) and equations with a symbol for the unknown number to represent the problem. (2-ESS2-1) 2.MD.B.5</p> <p>Reason abstractly and quantitatively. (2-ESS1-1), (2-ESS2-1), (K-2-ETS1-1) MP.2</p> <p>Model with mathematics (2-ESS1-1), (2-ESS2-1) MP.4</p> <p>Use appropriate tools strategically. (2-ESS2-1, (K-2-ETS1-1) MP.5</p> <p>Understand place value. (2-ESS1-1) 2.NBT.A</p> <p>Use addition and subtraction within 100 to solve word problems involving lengths that are given in the same units, e.g., by using drawings (such as drawings of rulers) and equations with a symbol for the unknown number to represent the problem. (2-ESS2-1) 2.MD.B.5</p> <p>Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in a bar graph. (K-2-ETS1-1) 2.MD.D.10</p> |   |
| <p><b>Unit Essential Questions</b></p> <ol style="list-style-type: none"> <li>1. How can we identify where water is found on Earth and if it is solid or liquid?</li> <li>2. In what ways can you represent the shapes and kinds of land and bodies of water in an area?</li> <li>3. What evidence can we find to prove that Earth events can occur quickly or slowly?</li> <li>4. In what ways do humans slow or prevent wind or water from changing the shape of the land?</li> </ol>   | <p><b>Unit Understandings</b></p> <ul style="list-style-type: none"> <li>• Patterns in the natural world can be observed.</li> <li>• Water is found in the ocean, rivers, lakes, and ponds. Water exists as solid ice and in liquid form.</li> <li>• Patterns in the natural world can be observed.</li> <li>• Maps show where things are located. One can map the shapes and kinds of land and water in any area.</li> <li>• Some events happen very quickly; others occur very slowly over a time period much longer than one can observe.</li> <li>• Things may change slowly or rapidly.</li> </ul> |
| <p><b>Unit Learning Targets (Outcomes) – Formative Assessment</b><br/> <i>Students who understand the concepts are able to ...</i></p>  |   |
| <ul style="list-style-type: none"> <li>• Observe patterns in the natural world</li> </ul>   |   |
| <ul style="list-style-type: none"> <li>• Obtain information using various texts, text features (e.g., headings, tables of contents, glossaries, electronic menus, icons) and other media that will be useful in answering a scientific question</li> </ul>  |   |
| <ul style="list-style-type: none"> <li>• Obtain information to identify where water is found on Earth and to communicate that it can be a solid or liquid.</li> </ul>   |   |

- Observe patterns in the natural world.

- Develop a model to represent patterns in the natural world.

- Develop a model to represent the shapes and kinds of land and bodies of water in an area.
- Make observations from several sources to construct an evidence-based account for natural phenomena.

- Use information from several sources to provide evidence that Earth events can occur quickly or slowly.

**Cross Cutting Concepts:**

**Patterns**

- Patterns in the natural world can be observed. (2-ESS2-2),(2-ESS2-3)

**Stability and Change**

- Things may change slowly or rapidly. (2-ESS1-1)
- Things may change slowly or rapidly. (2-ESS2-1)

**Structure and Function**

- The shape and stability of structures of natural and designed objects are related to their function(s). (K-2-ETS1-2)

**Integration of Technology: interactive whiteboard, videos**

**Technology Resources:** <https://jr.brainpop.com/science/land/>  
<http://www.onegeology.org/extra/kids/earthProcesses/home.html>

**Opportunities for Differentiation:**

- Structure lessons around questions that are authentic, relate to students' interests, social/family background and knowledge of their community.
- Provide students with multiple choices for how they can represent their understandings (e.g. multisensory techniques-auditory/visual aids; pictures, illustrations, graphs, charts, data tables, multimedia, modeling).
- Provide opportunities for students to connect with people of similar backgrounds (e.g. conversations via digital tool such as SKYPE, experts from the community helping with a project, journal articles, and biographies).
- Provide multiple grouping opportunities for students to share their ideas and to encourage work among various backgrounds and cultures (e.g. multiple representation and multimodal experiences).
- Engage students with a variety of Science and Engineering practices to provide students with multiple entry points and multiple ways to demonstrate their understandings.
- Use project-based science learning to connect science with observable phenomena.
- Structure the learning around explaining or solving a social or community-based issue.
- Provide ELL students with multiple literacy strategies.
- Collaborate with after-school programs or clubs to extend learning opportunities.
- UDL principles ([http://www.cast.org/our-work/about-udl.html#.VXmoXcfD\\_UA](http://www.cast.org/our-work/about-udl.html#.VXmoXcfD_UA)).

**Teacher Notes:**

**Career Ready Practices:** *In this unit the following career ready practices are addressed*

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

**Prior Learning- by the end of Grade 1 , students understand that:**

- 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. (secondary) Asking questions, making observations, and gathering information are helpful in thinking about problems.
- Before beginning to design a solution, it is important to clearly understand the problem.
- 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.
- Because there is always more than one possible solution to a problem, it is useful to compare and test designs.

**Evidence of Learning**

**Summative Assessment**

**Earth's Land and Water**

1. Students explain how landforms serve as models of earth's features.
2. Students locate and describe the main types of landform and water features.
3. Students are able to differentiate between saltwater and freshwater features.
4. Student groups work together to create a model representing Earth's landform and water features.

**Fast and Slow Changes to Earth**

1. Students differentiate between slow and fast changes to Earth's surface.
2. Students give examples of weathering and erosion as slow changes.
3. Students explain and give examples of fast changes to Earth's surface.

**Erosion**

1. Student groups work together to plan, design, build, and test a physical model to prevent or slow water from changing the shape of the land.

2. Student groups compare and analyze data from tests of each group’s design solution.

**Equipment needed:** Whiteboard, laptops, headphones, and hands-on materials for lessons

**Teacher Instructional Resources (Hyperlinks):**

**Modifications for ELL’s, Special Education, 504, and Gifted and Talented Students:**

*(Note: Teachers identify the modifications that they will use in the unit. See NGSS Appendix D: [All Standards, All Students/Case Studies for vignettes and explanations of the modifications.](#))*

- Structure lessons around questions that are authentic, relate to students’ interests, social/family background and knowledge of their community.
- Provide students with multiple choices for how they can represent their understandings (e.g. multisensory techniques-auditory/visual aids; pictures, illustrations, graphs, charts, data tables, multimedia, modeling).
- Provide opportunities for students to connect with people of similar backgrounds (e.g. conversations via digital tool such as SKYPE, experts from the community helping with a project, journal articles, and biographies).
- Provide multiple grouping opportunities for students to share their ideas and to encourage work among various backgrounds and cultures (e.g. multiple representation and multimodal experiences).
- Engage students with a variety of Science and Engineering practices to provide students with multiple entry points and multiple ways to demonstrate their understandings.
- Use project-based science learning to connect science with observable phenomena.
- Structure the learning around explaining or solving a social or community-based issue.
- Provide ELL students with multiple literacy strategies.
- Collaborate with after-school programs or clubs to extend learning opportunities.
- Restructure lesson using UDL principles  
([http://www.cast.org/our-work/about-udl.html#.VXmoXcfD\\_UA](http://www.cast.org/our-work/about-udl.html#.VXmoXcfD_UA))

| <u>ACTIVITIES</u>   | <u>MATERIALS</u> |
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| <p><b>Grade 2</b><br/>Earth and Space Science</p>             |                  |
| <p><b>Unit:</b> Fast and Slow Changes<br/><b>Concept:</b></p> |                  |
| <p><b><u>1.1 Earth’s Land and Water</u></b></p>               |                  |

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| <p><b><u>Session 1: (Approx. 1 day):</u></b><br/>Lesson Question: What does earth really look like?</p>   | <p>Student Activity Sheet 1<br/>Student Activity Sheet 2<br/>Inflatable globe<br/>Craft supplies</p>   |
| <p><b><u>Session 2: (Approx. 1 day):</u></b><br/>Lesson Question: Where is all the water on Earth?</p>  | <p>Student Activity Sheet 3<br/>Student Activity Sheet 4<br/>fresh water/salt water kit<br/>Measuring spoons<br/>water</p>                               |
| <p><b><u>Session 3: (Approx. 1 day):</u></b><br/>Lesson Question: what are landforms?</p>   | <p>Student Activity Sheet 5<br/>Craft supplies</p>   |
| <p><b><u>Session 4: (Approx. 1 day):</u></b><br/>Lesson Question: How can we make a model of Earth's landforms and water features? (Planning the model)</p>   | <p>Student Activity Sheet 1<br/>Student Activity Sheet 6<br/>Earth's Landforms and Water features kit<br/>I Notice/I wonder chart<br/>Craft supplies</p> |
| <p><b><u>Session 5: (Approx. 1 day):</u></b><br/>Lesson Question: How can we make a model of Earth's landforms and water features? (Building the model)</p>   | <p>Student Activity Sheet 6<br/>Earth's Landforms and Water features kit</p>   |
| <p><b><u>Session 6: (Approx. 1 day):</u></b><br/>Lesson Question: How can we make a model of Earth's landforms and water features? (Presenting the model)</p> | <p>Student Activity Sheet 7<br/>Student relief maps</p>  |
| <p><b><u>1.2 Fast and Slow Changes</u></b></p>  |  |
| <p><b><u>Session 1: (Approx. 1 day):</u></b><br/>Lesson Question: What is weathering?</p>   | <p>Weathering photos<br/>I notice/I wonder chart</p>   |
| <p><b><u>Session 2: (Approx. 1 day):</u></b><br/>Lesson Question: What causes weathering?</p>   | <p>Activity Sheet 1<br/>Activity Sheet 2</p>   |
| <p><b><u>Session 3: (Approx. 1 day):</u></b><br/>Lesson Question: How can we make a model of weathering?</p>  | <p>Activity Sheet 3<br/>Sandcastle weathering kit</p>  |
| <p><b><u>Session 4: (Approx. 1 day):</u></b><br/>Lesson Question: What is erosion?</p>  | <p>Erosion photos<br/>I notice/I wonder chart</p>  |



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| <p><b><u>Session 5: (Approx. 1 day):</u></b><br/>Lesson Question: What causes erosion?</p>   | <p>Activity Sheet 4<br/>Activity Sheet 2</p>  |
| <p><b><u>Session 6: (Approx. 2 days):</u></b><br/>Lesson Question: How can we make a model of erosion?</p>                             | <p>Activity Sheet 5<br/>Shoreline / Beach Erosion kit<br/>Hillside/Riverbank Erosion kit<br/>Landslide kit<br/>Optional small objects to represent trees and houses</p> |
| <p><b><u>Session 7: (Approx. 1 day):</u></b><br/>Lesson Question: What are some fast changes to Earth's surface?</p>                   | <p>Activity Sheet 6<br/>Activity Sheet 2</p>  |
| <p><b><u>1.3 Erosion Prevention Design Challenge</u></b></p>   |   |
| <p><b><u>Session 1: (Approx. 1 day):</u></b><br/>Lesson Question: How do plants affect erosion?</p>                                    | <p>Activity Sheet 1<br/>I notice/I wonder chart<br/>2 sloped trays<br/>Sprinkling can<br/>4-6 cups dry sand/each tray<br/>Measuring cups<br/>Grass or sod<br/>water</p> |
| <p><b><u>Session 2: (Approx. 1 day):</u></b><br/>Lesson Question: How can we design a site plan to minimize erosion on a hillside?</p> | <p>Erosion Prevention Site Planning<br/>Journal<br/>Sloped trays<br/>Craft sticks<br/>Pebbles<br/>Sand<br/>Measuring cups<br/>grass /sod</p>                            |
| <p><b><u>Session 3: (Approx. 1 day):</u></b><br/>Lesson Question: How can we build and test our site plan?</p>                         | <p>Erosion Prevention Site Planning<br/>Journal<br/>2 sprinkling cans<br/>Water<br/>Group trays</p>   |
| <p><b><u>Session 4: (Approx. 1 day):</u></b><br/>Lesson Question: How can we revise and retest our site plan?</p>                      | <p>Erosion Prevention Site Planning<br/>Journal<br/>Craft sticks<br/>Pebbles</p>  |

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|   | grass/sod<br>Group trays                                   |
| <b><u>Session 5: (Approx. 1 day):</u></b><br>Lesson Question: How can we share our site plan? | Erosion Prevention Site Planning<br>Journal<br>Group trays |