2. Earth’s Systems: Processes that Shape the Earth

Students who demonstrate understanding can:

2-ESS1-1. Use information from several sources to provide evidence that Earth events can occur quickly or slowly.

Clarification Statement: Examples of events and timescales could include volcanic explosions and earthquakes, which happen quickly and erosion of rocks, which occurs slowly. [Assessment Boundary: Assessment does not include quantitative measurements of timescales.]

2-ESS2-1. Compare multiple solutions designed to slow or prevent wind or water from changing the shape of the land.*

Clarification Statement: Examples of solutions could include different designs of dikes and windbreaks to hold back wind and water, and different designs for using shrubs, grass, and trees to hold back the land.

2-ESS2-2. Develop a model to represent the shapes and kinds of land and bodies of water in an area. [Assessment Boundary: Assessment does not include quantitative scaling in models.]

2-ESS2-3. Obtain information to identify where water is found on Earth and that it can be solid or liquid.

The performance expectations above were developed using the following elements from the NRC document A Framework for K-12 Science Education:

### Science and Engineering Practices

**Developing and Using Models**
- Modeling in 2-K builds on prior experiences and progress to the use of evidence and ideas in constructing evidence-based accounts of natural phenomena and designing solutions.
- Develop a model to represent patterns in the natural world. (2-ESS2-2)

**Constraining Explanations and Designing Solutions**
- Constructing explanations and designing solutions in 2-K builds on prior experiences and progresses to the use of evidence and ideas in constructing evidence-based accounts of natural phenomena and designing solutions.
- Make observations from several sources to construct an evidence-based account for natural phenomena. (2-ESS1-1)
- Compare multiple solutions to a problem. (2-ESS2-1)

**Obtaining, Evaluating, and Communicating Information**
- Obtain, evaluating, and communicating information in 2-K builds on prior experiences and uses observations and texts to communicate new 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)

### Disciplinary Core Ideas

**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**
- Construct an explanation of the properties of a material that makes the material suitable for a particular purpose. (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 exists in solid ice and in liquid form. (2-ESS2-3)

**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. (Secondary to 2-ESS2-1)

### Crosscutting Concepts

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

**Stability and Change**
- Some changes happen very slowly; others happen very quickly. (2-ESS1-1)
- Stability and change are typically described in terms of scale, rate, and predictability. (2-ESS2-1)

### Connections to Other Disciplines

**Connections to Engineering, Technology, and Applications of Science**
- Developing and using technology has impacts on the natural world. (2-ESS2-1)

### Connections to Nature of Science

Science addresses questions about the natural and material world.
- Scientists study the natural and material world. (2-ESS2-1)

### Common Core State Standards Connections:

**ELA/Literacy**

RI.2.1 Describe an object in a text by applying vocabulary that demonstrates understanding of key details in a text. (2-ESS1-1)
RI.2.3 Describe an object in a text by applying vocabulary that demonstrates understanding of key details in a text. (2-ESS2-1)
RI.2.9 Compare and contrast the most important points presented by two texts on the same topic. (2-ESS2-1)
W.2.6 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), (2-ESS2-3)
W.2.7 Participate in shared research and writing projects (e.g., a number of books on a single topic to produce a report; record science observations). (2-ESS1-1)
W.2.8 Recall information from experiences or gather information from provided sources to answer a question. (2-ESS1-1), (2-ESS2-3)
SL.2.2 Recount or describe key ideas or details from a text read aloud or information presented orally or through media. (2-ESS1-1)
SL.2.5 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)

**Mathematics**

MP.2 Reason abstractly and quantitatively. (2-ESS2-1), (2-ESS2-2)
MP.4 Model with mathematics. (2-ESS1-1), (2-ESS2-1), (2-ESS2-2)
MP.5 Use appropriate tools strategically. (2-ESS2-1)

2.NBT.A Understand place value. (2-ESS1-1)
2.NBT.A.3 Read and write numbers to 1000 using base-ten numerals, number names, and expanded form. (2-ESS2-2)
2.MD.B.5 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)

*The performance expectations marked with an asterisk integrate traditional science content with engineering through a Practice or Disciplinary Core Idea.


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