4-ESS1-1: Evidence from Rock Layers

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: Weathering and Erosion

Make observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation. (Cause and Effect)

4-ESS2-2: Mapping Earth's Features

Analyze and interpret data from maps to describe patterns of earth's features.

4-ESS3-2: Natural Hazard Design Solution

Generate and compare multiple solutions to reduce the impacts of natural earth processes on humans. (Cause and Effect)

ASSESSMENTS

4-ESS1-1 - Evidence from Rock Layers
4-ESS2-1 - Melting Glaciers
4-ESS2-2 - UK Earthquakes
4-ESS3-2 - T-Solution - A Tsunami Design Solution

ADDITIONAL RESOURCES

Mini Lessons, Graphic Organizers

EVALUATING LESSON/UNIT RESOURCE

Modifying Resource Lesson/Unit

Screening Tools

Back to Page 1

4-ESS1-1: Evidence from Rock Layers

Evidence Statement Assessment: The Oldest Rock Layer (Google Template)

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

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
Constructing Explanations and Designing Solutions Constructing explanations and designing solutions in 3–5 builds on K–2 experiences and progresses to the use of evidence in constructing explanations that specify variables that describe and predict phenomena and in designing multiple solutions to design problems. • Identify the evidence that supports particular points in an explanation.	**ESS1.C: The History of Planet Earth** • Local, regional, and global patterns of rock formations reveal changes over time due to earth forces, such as earthquakes. The presence and location of certain fossil types indicate the order in which rock layers were formed.	**Patterns** • Patterns can be used as evidence to support an explanation. --- ***Connections to Nature of Science*** **Scientific Knowledge Assumes an Order and Consistency in Natural Systems** • Science assumes consistent patterns in natural systems.

Reflections: *Type Here*

	No	Partial	Yes
1. The assessment contains a **phenomenon** (science) or a **problem** (engineering)			
2. The **prompts** match the Science and Engineering Practice (SEP) and engage students in sense making.			
3. The **stimuli** have multiple and sufficient information needed to utilize the SEP. (e.g. multiple data sets to analyze)			
4. The **prompts** elicit observable understanding of the Disciplinary Core Idea (DCI).			
5. The **prompts** explicitly mention the Crosscutting Concept (CCC).			
6. The **prompts** include language (i.e. bullets) from grade appropriate progressions. (SEP)(DCI)(CCC)			
7. The **phenomenon** or **problem** is novel to show the transfer of knowledge. (i.e. not in the unit)			

Screening Tools Back to Page 1

4-ESS2-1: Weathering and Erosion

Evidence Statement

Assessment: Melting Glaciers (Google Template)

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

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
Planning and Carrying Out Investigations Planning and carrying out investigations to answer questions or test solutions to problems in 3–5 builds on K–2 experiences and progresses to include investigations that control variables and provide evidence to support explanations or design solutions. • Make observations and/or measurements to produce data to serve as the basis for evidence for an explanation of a phenomenon.	**ESS2.A: Earth Materials and Systems** • Rainfall helps to shape the land and affects the types of living things found in a region. Water, ice, wind, living organisms, and gravity break rocks, soils, and sediments into smaller particles and move them around. **ESS2.E: Biogeology** • Living things affect the physical characteristics of their regions.	**Cause and Effect** • Cause and effect relationships are routinely identified, tested, and used to explain change.

Reflections: *Type Here*

	No	Partial	Yes
1. The assessment contains a **phenomenon** (science) or a **problem** (engineering)			
2. The **prompts** match the Science and Engineering Practice (SEP) and engage students in sense making.			
3. The **stimuli** have multiple and sufficient information needed to utilize the SEP. (e.g. multiple data sets to analyze)			
4. The **prompts** elicit observable understanding of the Disciplinary Core Idea (DCI).			
5. The **prompts** explicitly mention the Crosscutting Concept (CCC).			
6. The **prompts** include language (i.e. bullets) from grade appropriate progressions. (SEP)(DCI)(CCC)			
7. The **phenomenon** or **problem** is novel to show the transfer of knowledge. (i.e. not in the unit)			

Screening Tools Back to Page 1

4-ESS2-2: Mapping Earth's Features

Evidence Statement

Assessment: UK Earthquakes (Google Template)

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

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
Analyzing and Interpreting Data Analyzing data in 3–5 builds on K–2 experiences and progresses to introducing quantitative approaches to collecting data and conducting multiple trials of qualitative observations. When possible and feasible, digital tools should be used. • Analyze and interpret data to make sense of phenomena using logical reasoning.	**ESS2.B: Plate Tectonics and Large-Scale System Interactions** • The locations of mountain ranges, deep ocean trenches, ocean floor structures, earthquakes, and volcanoes occur in patterns. Most earthquakes and volcanoes occur in bands that are often along the boundaries between continents and oceans. Major mountain chains form inside continents or near their edges. Maps can help locate the different land and water features areas of Earth.	**Patterns** • Patterns can be used as evidence to support an explanation.

Reflections: *Type Here*

	No	Partial	Yes
1. The assessment contains a **phenomenon** (science) or a **problem** (engineering)			
2. The **prompts** match the Science and Engineering Practice (SEP) and engage students in sense making.			
3. The **stimuli** have multiple and sufficient information needed to utilize the SEP. (e.g. multiple data sets to analyze)			
4. The **prompts** elicit observable understanding of the Disciplinary Core Idea (DCI).			
5. The **prompts** explicitly mention the Crosscutting Concept (CCC).			
6. The **prompts** include language (i.e. bullets) from grade appropriate progressions. (SEP)(DCI)(CCC)			
7. The **phenomenon** or **problem** is novel to show the transfer of knowledge. (i.e. not in the unit)			

4-ESS3-2: Natural Design Hazard Solution

[Evidence Statement]

Assessment: T-Solution - A Tsunami Design Solution (Google Template)

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

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
Constructing Explanations and Designing Solutions Constructing explanations and designing solutions in 3–5 builds on K–2 experiences and progresses to the use of evidence in constructing explanations that specify variables that describe and predict phenomena and in designing multiple solutions to design problems. • Generate and compare multiple solutions to a problem based on how well they meet the criteria and constraints of the design solution.	**ESS3.B: Natural Hazards** • A variety of hazards result from natural processes (e.g., earthquakes, tsunamis, volcanic eruptions). Humans cannot eliminate the hazards but can take steps to reduce their impacts. *(Note: This Disciplinary Core Idea can also be found in 3.WC.)* **ETS1.B: Designing Solutions to Engineering Problems** • Testing a solution involves investigating how well it performs under a range of likely conditions.*(secondary)*	**Cause and Effect** • Cause and effect relationships are routinely identified, tested, and used to explain change. - - - - - - - - - - - - - - - - ***Connections to Engineering, Technology, and Applications of Science*** **Influence of Engineering, Technology, and Science on Society and the Natural World** • Engineers improve existing technologies or develop new ones to increase their benefits, to decrease known risks, and to meet societal demands.

Reflections: *Type Here*

	No	Partial	Yes
1. The assessment contains a **phenomenon** (science) or a **problem** (engineering)			
2. The **prompts** match the Science and Engineering Practice (SEP) and engage students in sense making.			
3. The **stimuli** have multiple and sufficient information needed to utilize the SEP. (e.g. multiple data sets to analyze)			
4. The **prompts** elicit observable understanding of the Disciplinary Core Idea (DCI).			
5. The **prompts** explicitly mention the Crosscutting Concept (CCC).			
6. The **prompts** include language (i.e. bullets) from grade appropriate progressions. (SEP)(DCI)(CCC)			
7. The **phenomenon** or **problem** is novel to show the transfer of knowledge. (i.e. not in the unit)			

Back to Page 1

Materials / Resources

Vocabulary

4-ESS1-1
Landscape
Rock formations (e.g. mountains, canyons, etc.)
Rock layers
- Ordering (deeper is older)
- Fossils (e.g. marine, land plants)

Earth events (e.g. earthquake, fault, river)
Patterns

4-ESS2-1
Weathering (effects)
Erosion (rates)
Earth features
Causes
- Slope
- Motion of water
- Temperature (i.e melting and freezing cycle)
- Wind
- Vegetation

4-ESS2-2
Maps (e.g topographic)
Earth features (e.g mountains, continental boundaries, ocean trenches, volcanoes)
Patterns

4-ESS3-2
Natural hazards
Earthquakes
Floods
Tsunamis
Volcanic eruptions

Design solutions (e.g earthquake resistant building, volcano monitoring, etc.)
Cause and Effect

Mini Lessons
Patterns Level 1 - Observational Patterns Mini-Lesson
Patterns Level 1 - Observational Patterns Thinking Slides
Causation Level 3 - Causal Relationships Mini-Lesson
Causation Level 3 - Causal Relationships Thinking Slides

Graphic Organizers
4-ESS1-1 - Rock and Fossil Layers Graphic Organizer (Student Version)
4-ESS1-1 - Rock and Fossil Layers Graphic Organizer (Teacher Version)
4-ESS2-1 - Weathering and Erosion Graphic Organizer (Student Version)
4-ESS2-1 - Weathering and Erosion Graphic Organizer (Teacher Version)
4-ESS2-2 - Patterns of Earth's Surface Graphic Organizer (Student Version)
4-ESS2-2 - Patterns of Earth's Surface Graphic Organizer (Teacher Version)
4-ESS3-2 - Natural Hazard Design Solution Graphic Organizer (Student Version)
4-ESS3-2 - Natural Hazard Design Solution Graphic Organizer (Teacher Version)
Phenomena Observation Graphic Organizer
Questioning Graphic Organizer
Modeling Graphic Organizer
Planning an Investigation Organizer
Investigation Evidence Organizer
Engaging in Argumentation Organizer

Modify, Add, Remove, Keep

MODIFY

Type Here

ADD

Type Here

Unit: *Type Here*

Standards: *Type Here*

Resource Used: *Type Here*

REMOVE

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KEEP

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