

DCI: Earth and Human Activity

4.ESS3.A: Natural Resources

Energy and fuels that humans use are derived from natural sources, and their use affects the environment in multiple ways. Some resources are renewable over time, and others are not. (4-ESS3-1)

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4.ESS3.B: Natural Hazards

A variety of natural hazards result from natural processes. Humans cannot eliminate natural hazards but can take steps to reduce their impacts. (4-ESS3-2)

DCI: Earth and Human Activity

4.ETS1.B: Developing Possible Solutions

Testing a solution involves investigating how well it performs under a range of likely conditions. (4-ESS3-2)

Performance Expectation

4-ESS3-1: Obtain and combine information to describe that energy and fuels are derived from natural resources and their uses affect the environment.

Clarification Statement: Examples of renewable energy resources could include wind energy, water behind dams, and sunlight; non-renewable energy resources are fossil fuels and fissile materials. Examples of environmental effects could include loss of habitat due to dams, loss of habitat due to surface mining, and air pollution from burning of fossil fuels.

Assessment Boundary: none

Performance Expectation

4-ESS3-2: Generate and compare multiple solutions to reduce the impacts of natural Earth processes on humans.

Clarification Statement: Examples of solutions could include designing an earthquake resistant building and improving monitoring of volcanic activity.

Assessment Boundary: Assessment is limited to earthquakes, floods, tsunamis, and volcanic eruptions.

Science and Engineering Practice

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. (4-ESS3-2)

Science and Engineering Practice

Obtaining, Evaluating, and Communicating Information

Obtaining, evaluating, and communicating information in 3–5 builds on K–2 experiences and progresses to evaluating the merit and accuracy of ideas and methods.

Obtain and combine information from books and other reliable media to explain phenomena. (4-ESS3-1)

Crosscutting Concept

Cause and Effect

Cause and effect relationships are routinely identified, tested, and used to explain change. (4-ESS3-2)

Crosscutting Concept

Cause and Effect

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Connection to Engineering, Technology, and Applications of Science

Influence of Science, Engineering, and Technology on Society and the Natural World

Over time, people's needs and wants change, as do their demands for new and improved technologies. (4-ESS3-1)

Connection to Engineering, Technology, and Applications of Science

Influence of Science, Engineering, and Technology 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. (4-ESS3-2)

Connection to Engineering, Technology, and Applications of Science

Interdependence of Science, Engineering, and Technology

Knowledge of relevant scientific concepts and research findings is important in engineering. (4-ESS3-1)

Common Core State Standards for ELA/Literacy

Reading Informational Text

RI.4.1 - Key Ideas and Details

Refer to details and examples in a text when explaining what the text says explicitly and when drawing inferences from the text. (4-ESS3-2)

Common Core State Standards for ELA/Literacy

Reading Informational Text

RI.4.9 - Integration of Knowledge and Ideas

Integrate information from two texts on the same topic in order to write or speak about the subject knowledgeably. (4-ESS3-2)

Common Core State Standards for ELA/Literacy

Card Type name

W.4.7 - Research to Build and Present Knowledge

Conduct short research projects that build knowledge through investigation of different aspects of a topic. (4-ESS3-1)

Common Core State Standards for ELA/Literacy

Card Type name

W.4.8 - Research to Build and Present Knowledge

Recall relevant information from experiences or gather relevant information from print and digital sources; take notes and categorize information, and provide a list of sources. (4-ESS3-1)

Common Core State Standards for ELA/Literacy

Card Type name

W.4.9 - Research to Build and Present Knowledge

Draw evidence from literary or informational texts to support analysis, reflection, and research. (4-ESS3-1)

Common Core State Standards for Mathematics

Operations & Algebraic Thinking

4.OA.A.1 - Use the four operations with whole numbers to solve problems.

Interpret a multiplication equation as a comparison, e.g., interpret $35 = 5 \times 7$ as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as multiplication equations. (4-ESS3-1), (4-ESS3-2)

Common Core State Standards for Mathematics

Mathematical Practices

MP.2 - Reason abstractly and quantitatively

CCSS text (4-ESS3-1), (4-ESS3-2)

Common Core State Standards for Mathematics

Mathematical Practices

MP.4 - Model with mathematics

CCSS text (4-ESS3-1), (4-ESS3-2)