

5-ESS3-1 Earth and Human Activity

California Science Test—Item Content Specifications

# 5-ESS3-1 Earth and Human Activity

Students who demonstrate understanding can:

Obtain and combine information about ways individual communities use science ideas to protect the Earth’s resources and environment.

| Science and Engineering Practices | Disciplinary Core Ideas | Crosscutting Concepts |
| --- | --- | --- |
| 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/or other reliable media to explain phenomena or solutions to a design problem. | ESS3.C: Human Impacts on Earth Systems   1. Human activities in agriculture, industry, and everyday life have had major effects on the land, vegetation, streams, ocean, air, and even outer space. But individuals and communities are doing things to help protect Earth’s resources and environments. | Systems and System Models  A system can be described in terms of its components and their interactions.  Connections to Nature of Science  Science Addresses Questions About the Natural and Material World.  Science findings are limited to questions that can be answered with empirical evidence. |

## Assessment Targets

Assessment targets describe the focal knowledge, skills, and abilities for a given three-dimensional Performance Expectation. Please refer to the Introduction for a complete description of assessment targets.

### Science and Engineering Subpractice(s)

Please refer to appendix A for a complete list of Science and Engineering Practices (SEP) subpractices. Note that the list in this section is not exhaustive.

8.1 Ability to comprehend and evaluate text in terms of its validity, reliability, and sources

### Science and Engineering Subpractice Assessment Targets

Please refer to appendix A for a complete list of SEP subpractice assessment targets. Note that the list in this section is not exhaustive.

8.1.1 Ability to obtain relevant information through conducting searches in print and online sources and evaluate the reliability of the obtained information

8.1.3 Ability to summarize information from a single source and/or combine and synthesize information from multiple sources in order to address a question or solve a problem

### Disciplinary Core Idea Assessment Targets

#### ESS3.C.2

* Address the effects to Earth’s environment (and natural resources) of a given human activity
* Use scientific understanding of human impacts in order to discuss human stewardship of the Earth
* Differentiate the scale of human activity (e.g., single-sourced, collective action, locally-limited, globally-occurring, etc.) from the scale of environmental impact
* Differentiate human activities that can have positive environmental impacts from activities which have known negative impacts
* Consider the limitation of humans to affect positive or negative change based on ongoing processes (e.g., humans can’t stop natural emissions of volcanic sulfates, but can limit emissions from power plants)

### Crosscutting Concept Assessment Target(s)

CCC4 Describe a system in terms of its components and their interactions

## Examples of Integration of Assessment Targets and Evidence

Note that the list in this section is not exhaustive.

Task provides information from various media sources to explain phenomena or solutions to a design problem:

* Identifies which solutions support a design problem and which solutions do not (8.1.2, ESS3.C.2, and CCC4)
* Identifies the source(s) of error and methodological flaw(s) in design solutions of human activity on the environment (8.1.2, ESS3.C.2, and CCC4)

Task provides students with information from a single source in order to address a question or solve a problem:

* Identifies the effects of a given human activity on the environment (8.1.3, ESS3.C.2, and CCC4)
* Uses information to discuss human stewardship of Earth (8.1.3, ESS3.C.2, and CCC4)
* Differentiates the scale of human activity from the scale of the environmental impact (8.1.3, ESS3.C.2, and CCC4)

Task provides students with information from multiple sources in order to address a question or solve a problem:

* Combines and synthesizes information on the effects of a given human activity on the environment (8.1.3, ESS3.C.2, and CCC4)
* Differentiates human activities that can have positive environmental impacts from activities that have known negative impacts (8.1.3, ESS3.C.2, and CCC4)
* Considers the limitations of humans to affect positive or negative change based on ongoing processes (8.1.3, ESS3.C.2, and CCC4)

## California Environmental Principles and Concepts

* EP2: The long-term functioning and health of terrestrial, freshwater, coastal, and marine ecosystems are influenced by their relationships with human societies.

## Possible Phenomena or Contexts

Note that the list in this section is not exhaustive.

* Pollution (e.g., taking water samples from a river)
* Algal bloom in a lake (e.g., reporting and tracking algal blooms)
* Invasive species (e.g., replacing invasive plants with native species)
* Recycling or reducing waste (e.g., reducing the use of plastic bags in grocery stores)
* Restoration or protection of natural habitats (e.g., providing sanctuaries for monarch butterflies)

## Common Misconceptions

Note that the list in this section is not exhaustive.

* Local behavior can only lead to local consequences (or that global behavior can only lead to global consequences).
* Humans have total control over Earth’s systems.
* Local waste disposal is a termination stage in the cycling of Earth’s matter (i.e., once it’s in the garbage can, the waste disappears).
* All naturally occurring substances in Earth are good and all substances added to Earth by humans are bad.

## Additional Assessment Boundaries

None listed at this time.

## Additional References

5-ESS3-1 Evidence Statement [https://www.nextgenscience.org/sites/default/files/evidence\_statement/black\_white/5-ESS3-1 Evidence Statements June 2015 asterisks.pdf](https://www.nextgenscience.org/sites/default/files/evidence_statement/black_white/5-ESS3-1%20Evidence%20Statements%20June%202015%20asterisks.pdf)

Environmental Principles and Concepts <http://californiaeei.org/abouteei/epc/>

California Education and the Environment Initiative <http://californiaeei.org/>

The *2016 Science Framework for California Public Schools Kindergarten through Grade 12*

Appendix 1: Progression of the Science and Engineering Practices, Disciplinary Core Ideas, and Crosscutting Concepts in Kindergarten through Grade 12 <https://www.cde.ca.gov/ci/sc/cf/documents/scifwappendix1.pdf>

Appendix 2: Connections to Environmental Principles and Concepts <https://www.cde.ca.gov/ci/sc/cf/documents/scifwappendix2.pdf>

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