

5-ESS2-2 Earth's Systems

California Science Test—Item Content Specifications

# 5-ESS2-2 Earth's Systems

Students who demonstrate understanding can:

Describe and graph the amounts of salt water and fresh water in various reservoirs to provide evidence about the distribution of water on Earth.

[*Assessment Boundary: Assessment is limited to oceans, lakes, rivers, glaciers, ground water, and polar ice caps, and does not include the atmosphere.*]

| Science and Engineering Practices | Disciplinary Core Ideas | Crosscutting Concepts |
| --- | --- | --- |
| Using Mathematics and Computational Thinking  Mathematical and computational thinking in 3–5 builds on K–2 experiences and progresses to extending quantitative measurements to a variety of physical properties and using computation and mathematics to analyze data and compare alternative design solutions.  Describe and graph quantities such as area and volume to address scientific questions. | ESS2.C: The Roles of Water in Earth’s Surface Processes   1. Nearly all of Earth’s available water is in the ocean. Most fresh water is in glaciers or underground; only a tiny fraction is in streams, lakes, wetlands, and the atmosphere. | Scale, Proportion, and Quantity  Standard units are used to measure and describe physical quantities such as weight and volume. |

## 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.

5.1 Ability to develop mathematical and/or computational models (e.g., graphical representation in a simulation)

### 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.

5.1.1 Ability to generate mathematical representations to describe characteristics and patterns of a scientific phenomenon and/or a design solution

5.1.2 Ability to use units of measurement, diagrams, and graphs to record and organize data gathered directly or provided from scientific investigations

5.1.3 Ability to create, evaluate, and/or revise a computational model or simulation of a scientific phenomenon, a design solution, or both

### Disciplinary Core Idea Assessment Targets

#### ESS2.C.2

* Describe how the majority of water on Earth is found in the oceans
* Describe how most of the Earth’s freshwater is stored in glaciers or underground
* Describe how a small fraction of freshwater is found in lakes, rivers, wetland, and the atmosphere

### Crosscutting Concept Assessment Target(s)

CCC3 Use standard units to measure and describe physical quantities such as weight and volume

## Examples of Integration of Assessment Targets and Evidence

Note that the list in this section is not exhaustive.

Task provides data about the amounts of salt water and freshwater in various reservoirs on Earth:

* Develops a mathematical model/graph of the given data to represent relationships among the variables (5.1.1, ESS2.C.2, and CCC3)

Task provides a diagram or graph about the distribution of water on Earth:

* Identifies patterns or relationships revealed in the diagrams or graphs (5.1.2, ESS2.C.2, and CCC3)

Task provides a description of how salt water and/or freshwater is distributed in different reservoirs on Earth:

* Identifies a diagram or graph that best reflects the phenomenon described (5.1.3, ESS2.C.2, and CCC3)

## California Environmental Principles and Concepts

* EP3: Natural systems proceed through cycles that humans depend upon, benefit from, and can alter.

## Possible Phenomena or Contexts

Note that the list in this section is not exhaustive.

* Volumes/percentages of surface water and groundwater
* Areas of watersheds and volumes of water draining from them
* Changes in glacial coverage or glacial volume over time
* Data from water wells to illustrate changes in a water table over time

## Common Misconceptions

Note that the list in this section is not exhaustive.

* Most water on Earth is freshwater.
* Most of the freshwater on Earth is in lakes and rivers.
* Most freshwater is available for human use.

## Additional Assessment Boundaries

None listed at this time.

## Additional References

5-ESS2-2 Evidence Statement [https://www.nextgenscience.org/sites/default/files/evidence\_statement/black\_white/5-ESS2-2 Evidence Statements June 2015 asterisks.pdf](https://www.nextgenscience.org/sites/default/files/evidence_statement/black_white/5-ESS2-2%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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