

HS-ETS1-4 Engineering Design

California Alternate Assessment for Science—Item Content Specifications

# HS-ETS1-4 Engineering Design

| California Science Connector | Focal Knowledge, Skills, and Abilities | Essential Understanding |
| --- | --- | --- |
| Use computer simulations to evaluate the impact of proposed solutions to a real-world problem to see which one is most efficient or economical. | 1. Ability to use computer simulations to evaluate the impact of proposed solutions to a real-world problem to see which one is most efficient or economical. 2. Ability to use computer simulations to evaluate solutions to see which one is most efficient or economical. | Compare different possible solutions to a real-world problem. |

## **CA NGSS Performance Expectation**

Students who demonstrate understanding can:

**Use a computer simulation to model the impact of proposed solutions to a complex real-world problem with numerous criteria and constraints on interactions within and between systems relevant to the problem.**

## Mastery Statements

Students will be able to:

* Identify the best solution to a real-world problem
* Use the results of a computer simulation to identify which solution to a real-world problem is most efficient or economical
* Use the results of a computer simulation on the impact of a solution to a real-world problem to identify which solution is most efficient or economical
* Use the results of a computer simulation to identify which solution to a real-world problem is most efficient or economical and which is least efficient or economical
* Use the results of a computer simulation to identify which solution impact for a real‑world problem is most efficient or economical and which is least efficient or economical

## Possible Phenomena or Contexts

*Note that the list in this section is not exhaustive or prescriptive.*

**Possible contexts include the following:**

* Ways to reduce garbage production
* Air pollution from smog or wildfires that affects people’s ability to spend time outside
* Ways to improve the habitat for birds and common city wildlife
* Enhancing mobility for people with disabilities
* Ways to reduce energy use or use cleaner energy sources

## Additional Assessment Boundaries

* None listed at this time

## Additional References

California Science Test Item Specification for HS-ETS1-4

<https://www.cde.ca.gov/ta/tg/ca/documents/itemspecs-hs-ets1-4.docx>

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

The *2016 Science Framework for California Public Schools Kindergarten through Grade Twelve* <https://www.cde.ca.gov/ci/sc/cf/cascienceframework2016.asp>

Appendix 1: Progression of the Science and Engineering Practices, Disciplinary Core Ideas, and Crosscutting Concepts in Kindergarten through Grade Twelve

<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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