

3-5-ETS1-1 Engineering Design

California Alternate Assessment for Science—Item Content Specifications

# 3-5-ETS1-1 Engineering Design

| California Science Connector | Focal Knowledge, Skills, and Abilities | Essential Understanding |
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| Define a simple design problem that can be solved with the development of a new or improved object, tool, or process, and identify the materials and the amount of time needed to develop a successful solution. | 1. Ability to define a simple design problem that can be solved with the development of a new or improved object, tool, or process. 2. Ability to identify the materials and the amount of time needed to develop the improved object, tool, or process. | Recognize that materials, time, or cost, limits solutions to simple design problems. |

## CA NGSS Performance Expectation

Students who demonstrate understanding can:

**Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.**

## Mastery Statements

Students will be able to:

* Match a simple design problem to a new or improved tool or object that can help solve the problem
* Recognize the limitations of a solution based on the materials needed to implement the solution
* Recognize the limitations of a solution based on the time needed to implement the solution
* Recognize the limitations of a solution based on the cost of implementing the solution
* Identify the materials needed to develop an improved object, tool, or process
* Identify the time needed to develop an improved object, tool, or process
* Match a simple design problem to a new or improved process that can help solve the problem
* Identify two reasons that an object, tool, or process will help to solve a simple design problem
* Identify two reasons that specified materials and/or time are needed to solve a simple design problem

## Environmental Principles and Concepts

Principle 5—Decisions affecting resources and natural systems are based on a wide range of considerations and decision-making processes.

## Possible Phenomena or Contexts

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

**Possible contexts include the following:**

* Problems involving the cost of implementing an improvement to a simple system, (e.g., using an electric pencil sharpener instead of a manual one)
* Problems involving repairing a broken system quickly in order to mitigate ongoing negative impacts, (e.g., the need to repair an air conditioner quickly when it is very hot outside)
* Problems involving preventing a negative event, such as an egg breaking when dropped from a height, constrained by a limited set of available materials

## Additional Assessment Boundaries

* None listed at this time

## Additional References

California Science Test Item Specification for 3-5-ETS1-1

<https://www.cde.ca.gov/ta/tg/ca/documents/itemspecs-3-5-ets1-1.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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