

HS-PS1-4 Matter and Its Interactions

California Alternate Assessment for Science—Item Content Specifications

# HS-PS1-4 Matter and Its Interactions

| California Science Connector | Focal Knowledge, Skills, and Abilities | Essential Understanding |
| --- | --- | --- |
| Using a model, determine whether energy is released or absorbed in a chemical reaction system. | 1. Ability to use a model containing data in a graph or table to determine whether energy is released or absorbed in a chemical reaction system.
 | Determine whether energy is released or absorbed in a chemical reaction system. |

## **CA NGSS Performance Expectation**

Students who demonstrate understanding can:

**Develop a model to illustrate that the release or absorption of energy from a chemical reaction system depends upon the changes in total bond energy.** [Clarification Statement: Emphasis is on the idea that a chemical reaction is a system that affects the energy change. Examples of models could include molecular-level drawings and diagrams of reactions, graphs showing the relative energies of reactants and products, and representations showing energy is conserved.] *[Assessment Boundary: Assessment does not include calculating the total bond energy changes during a chemical reaction from the bond energies of reactants and products.]*

## Mastery Statements

Students will be able to:

* Recognize a temperature increase or decrease when two products are combined
* Recognize a chemical reaction that releases energy
* Recognize a chemical reaction that absorbs energy
* Identify that a chemical reaction occurred based on a change in temperature
* Identify that a chemical reaction occurred based on the release of light
* Evaluate data in a graph or table to identify whether energy was absorbed or released in a chemical reaction

## Possible Phenomena or Contexts

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

**Possible contexts include the following:**

* Pictures of flame
* Data tables or graphs showing beginning and ending temperatures of combined substances
* Before and after pictures of thermometers in substances that have been combined

## Additional Assessment Boundaries

* None listed at this time

## Additional References

California Science Test Item Specification for HS-PS1-4

<https://www.cde.ca.gov/ta/tg/ca/documents/itemspecs-hs-ps1-4.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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