

MS-PS1-6 Matter and its Interactions

California Alternate Assessment for Science—Item Content Specifications

# MS-PS1-6 Matter and its Interactions

| California Science Connector | Focal Knowledge, Skills, and Abilities | Essential Understanding |
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| Identify or modify a device in which a chemical process releases or absorbs thermal energy. | 1. Ability to identify or modify a device in which a chemical process releases thermal energy. 2. Ability to identify or modify a device in which a chemical process absorbs thermal energy. | Identify examples of chemical reactions that release energy (e.g., heat, light). |

## **CA NGSS Performance Expectation**

Students who demonstrate understanding can:

**Undertake a design project to construct, test, and modify a device that either releases or absorbs thermal energy by chemical processes.** [Clarification Statement: Emphasis is on the design, controlling the transfer of energy to the environment, and modification of a device using factors such as type and concentration of a substance. Examples of designs could involve chemical reactions such as dissolving ammonium chloride or calcium chloride.] *[Assessment Boundary*: *Assessment is limited to the criteria of amount, time, and temperature of substance in testing the device.]*

## Mastery Statements

Students will be able to:

* Identify an example of a chemical reaction that releases heat or light
* Identify a device that uses a chemical reaction to release thermal energy
* Identify a device that uses a chemical reaction to absorb thermal energy
* Identify a change in temperature as evidence that a device is releasing or absorbing thermal energy
* Identify how to change the amount of thermal energy a device releases or absorbs

## Possible Phenomena or Contexts

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

**Possible contexts include the following:**

* Burning common materials
* Combining common household materials such as hydrogen peroxide and yeast
* Instant cold/hot packs (dissolution of ammonium nitrate, magnesium sulfate, calcium chloride, etc.)
* Flameless ration heaters (used by the US military to heat meals, based on reaction between Mg metal and water)

## Additional Assessment Boundaries

* Do not use names of chemicals or compounds.
* Refer to substances as a liquid or a powder (or appropriate term for state of matter).

## Additional References

California Science Test Item Specification for MS-PS1-6

<https://www.cde.ca.gov/ta/tg/ca/documents/itemspecs-ms-ps1-6.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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