

HS-PS1-8 Matter and Its Interactions

California Alternate Assessment for Science—Item Content Specifications

# HS-PS1-8 Matter and Its Interactions

| California Science Connector | Focal Knowledge, Skills, and Abilities | Essential Understanding |
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| Identify changes in the composition of the center of an atom during a reaction. | 1. Ability to identify the center of an atom. 2. Ability to identify the changes to the center of an atom that occur during a reaction. | Identify that there are reactions that produce more energy than basic chemical reactions. |

## **CA NGSS Performance Expectation**

Students who demonstrate understanding can:

**Develop models to illustrate the changes in the composition of the nucleus of the atom and the energy released during the processes of fission, fusion, and radioactive decay.** [Clarification Statement: Emphasis is on simple qualitative models, such as pictures or diagrams, and on the scale of energy released in nuclear processes relative to other kinds of transformations.] *[Assessment Boundary: Assessment does not include quantitative calculation of energy released. Assessment is limited to alpha, beta, and gamma radioactive decays.]*

## Mastery Statements

Students will be able to:

* Identify the center of an atom
* Identify that nuclear reactions produce more energy than chemical reactions
* Identify a nuclear reaction can give off tiny particles
* Recognize the center of an atom is made of tiny particles
* Recognize energy is released when the nucleus of an atom reacts

## Possible Phenomena or Contexts

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

**Possible contexts include the following:**

* Simple diagrams that show the basic structure of the atom, with electron orbitals and the nucleus
* Simple diagrams that show the nuclei of two atoms colliding to form one atom with a single nucleus
* Simple diagrams that show nuclear and chemical reactions

## Additional Assessment Boundaries

* Only fusion reactions are included.

## Additional References

California Science Test Item Specification for HS-PS1-8

<https://www.cde.ca.gov/ta/tg/ca/documents/itemspecs-hs-ps1-8.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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