

HS-PS2-3 Motion and Stability: Forces and Interactions

California Alternate Assessment for Science—Item Content Specifications

# HS-PS2-3 Motion and Stability: Forces and Interactions

| California Science Connector | Focal Knowledge, Skills, and Abilities | Essential Understanding |
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| Evaluate a device designed to minimize force by comparing data (e.g., momentum, mass, velocity, force, time). | 1. Ability to evaluate a device designed to minimize force by comparing data. | Identify cause and effect relationships between force and the outcome of a collision. |

## **CA NGSS Performance Expectation**

Students who demonstrate understanding can:

**Apply scientific and engineering ideas to design, evaluate, and refine a device that minimizes the force on a macroscopic object during a collision.** [Clarification Statement: Examples of evaluation and refinement could include determining the success of the device at protecting an object from damage and modifying the design to improve it. Examples of a device could include a football helmet or a parachute.] *[Assessment Boundary: Assessment is limited to qualitative evaluations and/or algebraic manipulations.]*

## Mastery Statements

Students will be able to:

* Recognize the faster an object is going, the greater the effect of a collision
* Recognize common objects used in daily life to minimize the effect of a collision
* Use data to evaluate which device will minimize the effect of an impact

## Possible Phenomena or Contexts

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

**Possible contexts include the following:**

* Seatbelts, bumpers, airbags
* Packaging containers
* Helmets, hardhats
* Baseball mitts
* Gym mats, safety nets, climbing ropes

## Additional Assessment Boundaries

* None listed at this time

## Additional References

California Science Test Item Specification for HS-PS2-3

<https://www.cde.ca.gov/ta/tg/ca/documents/itemspecs-hs-ps2-3.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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