

MS-PS2-1 Motion and Stability: Forces and Interactions

California Alternate Assessment for Science—Item Content Specifications

# MS-PS2-1 Motion and Stability: Forces and Interactions

| California Science Connector | Focal Knowledge, Skills, and Abilities | Essential Understanding |
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| Through observation and demonstration, identify that when objects collide, the contact forces transfer energy and changes the objects’ motions. | 1. Recognize a solution to a problem involving the motion of two colliding objects. | Recognize the result of the implementation of a solution to the problem of two objects colliding. |

## **CA NGSS Performance Expectation**

Students who demonstrate understanding can:

**Apply Newton’s Third Law to design a solution to a problem involving the motion of two colliding objects.** [Clarification Statement: Examples of practical problems could include the impact of collisions between two cars, between a car and stationary objects, and between a meteor and a space vehicle.] *[Assessment Boundary*: *Assessment is limited to vertical or horizontal interactions in one dimension.]*

## Mastery Statements

Students will be able to:

* Identify how the movement of two objects will change when they collide
* Identify clothing or gear that minimizes the effect of a collision
* Identify common packaging that minimizes the effect of a collision
* Identify features of modes of transportation that minimize the effect of a collision
* Recognize how a solution to the problem of a collision was effective

## Possible Phenomena or Contexts

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

**Possible contexts include the following:**

* Crumple zones in car accidents
* Airbag deployment
* Protective gear and clothing such as helmets, knee and elbow pads, etc.
* Bubble wrap
* Foam egg cartons

## Additional Assessment Boundaries

* None listed at this time

## Additional References

California Science Test Item Specification for MS-PS2-1

<https://www.cde.ca.gov/ta/tg/ca/documents/itemspecs-ms-ps2-1.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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