

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

California Alternate Assessment for Science—Item Content Specifications

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

| California Science Connector | Focal Knowledge, Skills, and Abilities | Essential Understanding |
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| Recognize the relationship between an object’s acceleration and the force. | 1. Identify that a decrease in acceleration is caused by a change in the net force.
 | Identify that increasing the force exerted on an object increases the acceleration of the object. |

## **CA NGSS Performance Expectation**

Students who demonstrate understanding can:

**Analyze data to support the claim that Newton’s second law of motion describes the mathematical relationship among the net force on a macroscopic object, its mass, and its acceleration.** [Clarification Statement: Examples of data could include tables or graphs of position or velocity as a function of time for objects subject to a net unbalanced force, such as a falling object, an object rolling down a ramp, or a moving object being pulled by a constant force.] *[Assessment Boundary: Assessment is limited to one-dimensional motion and to macroscopic objects moving at non-relativistic speeds.]*

## Mastery Statements

Students will be able to:

* Recognize that the speed of an object is dependent on the force exerted on it
* Recognize when an object is moving at a constant speed, a push or pull in the opposite direction will make the object slow down

## Possible Phenomena or Contexts

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

**Possible contexts include the following:**

* Scenarios showing a toy being pushed or pulled
* Scenarios showing a heavy object being pushed or pulled
* Scenarios showing children manipulating a cart or wagon to make it speed up or slow down

## Additional Assessment Boundaries

* None listed at this time

## Additional References

California Science Test Item Specification for HS-PS2-1

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