

5-PS1-3 Matter and Its Interactions

California Science Test—Item Content Specifications

# 5-PS1-3 Matter and Its Interactions

Students who demonstrate understanding can:

Make observations and measurements to identify materials based on their properties.

[Clarification Statement: Examples of materials to be identified could include baking soda and other powders, metals, minerals, and liquids. Examples of properties could include color, hardness, reflectivity, electrical conductivity, thermal conductivity, response to magnetic forces, and solubility; density is not intended as an identifiable property.] [*Assessment Boundary: Assessment does not include density or distinguishing mass and weight.*]

| Science and Engineering Practices | Disciplinary Core Ideas | Crosscutting Concepts |
| --- | --- | --- |
| Planning and Carrying Out Investigations  Planning and carrying out investigations to answer questions or test solutions to problems in 3–5 builds on K–2 experiences and progresses to include investigations that control variables and provide evidence to support explanations or design solutions.  Make observations and measurements to produce data to serve as the basis for evidence for an explanation of a phenomenon. | PS1.A: Structure and Properties of Matter   1. Measurements of a variety of properties can be used to identify materials. (Boundary: At this grade level, mass and weight are not distinguished, and no attempt is made to define the unseen particles or explain the atomic-scale mechanism of evaporation and condensation.) | Scale, Proportion, and Quantity  Standard units are used to measure and describe physical quantities such as weight, time, temperature, and volume. |

## Assessment Targets

Assessment targets describe the focal knowledge, skills, and abilities for a given three-dimensional Performance Expectation. Please refer to the Introduction for a complete description of assessment targets.

### Science and Engineering Subpractice(s)

Please refer to appendix A for a complete list of Science and Engineering Practices (SEP) subpractices. Note that the list in this section is not exhaustive.

3.1 Ability to clarify the goal of the investigation and identify the evidence needed to address the purpose of the investigation

3.3 Ability to collect the data for the investigation

### Science and Engineering Subpractice Assessment Targets

Please refer to appendix A for a complete list of SEP subpractice assessment targets. Note that the list in this section is not exhaustive.

3.1.3 Ability to describe what and how much data need to be collected to provide sufficient evidence for the purpose of the investigation

3.1.4 Ability to describe how the observations and/or collected data can be used as evidence for the phenomenon under investigation

3.3.3 Ability to evaluate the quality of data to determine if the evidence meets the goals of the investigation

### Disciplinary Core Idea Assessment Targets

#### PS1.A.6

* Recognize that materials can be identified based on their observable and measurable properties
* Identify the different observable and measurable properties that are useful for identifying materials
* Identify the standard units (e.g., grams or liters) for quantitative measurements of properties
* Differentiate between an electrical conductor and a nonconductor based on the flow of electricity through an object
* Differentiate between a thermal conductor and a nonconductor based on the flow of heat through an object
* Differentiate between a magnetic and nonmagnetic material based on the response of an object in the presence of a magnet

### Crosscutting Concept Assessment Target(s)

CCC3 Use standard units to measure and describe physical quantities such as weight, time, temperature, and volume

## Examples of Integration of Assessment Targets and Evidence

Note that the list in this section is not exhaustive.

Task provides a scenario that involves identifying a material or materials based on their properties:

* Describes the observations or measurements of properties that should be collected to identify the material(s) (3.1.3, PS1.A.6, and CCC3)
* Explains why certain observations and measurements are useful for identifying the material(s) (3.1.4, PS1.A.6, and CCC3)

Task provides data collected to determine the identity of a material or materials:

* Evaluates whether the data are sufficient to identify the material(s) (3.3.3, PS1.A.6, and CCC3)
* Selects which data are useful to identify the material(s) (3.3.3, PS1.A.6, and CCC3)

## Possible Phenomena or Contexts

Note that the list in this section is not exhaustive.

* Observation or comparison of properties such as color, luster, relative hardness, and magnetism
* Solubility in familiar liquids (e.g., salt, flour, or baking soda in water or oil)
* Reactivity with other materials to produce easily identifiable compounds
* Thermal or electrical conductivity

## Common Misconceptions

Note that the list in this section is not exhaustive.

* All shiny or reflective objects are made of metals.
* All metal objects are attracted to magnets.
* Charged objects never interact with neutral objects.
* Larger magnets always are stronger magnets.

## Additional Assessment Boundaries

None listed at this time.

## Additional References

5-PS1-3 Evidence Statement [https://www.nextgenscience.org/sites/default/files/evidence\_statement/black\_white/5-PS1-3 Evidence Statements June 2015 asterisks.pdf](https://www.nextgenscience.org/sites/default/files/evidence_statement/black_white/5-PS1-3%20Evidence%20Statements%20June%202015%20asterisks.pdf)

The *2016 Science Framework for California Public Schools Kindergarten through Grade 12*

Appendix 1: Progression of the Science and Engineering Practices, Disciplinary Core Ideas, and Crosscutting Concepts in Kindergarten through Grade 12 <https://www.cde.ca.gov/ci/sc/cf/documents/scifwappendix1.pdf>

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