

## 5-PS1-3 Matter and Its Interactions

Students who demonstrate understanding can:

- 5-PS1-3. 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.]

The performance expectation above was developed using the following elements from the NRC document *A Framework for K-12 Science Education*:

### Science and Engineering Practices

#### 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.

### Disciplinary Core Ideas

#### PS1.A: Structure and Properties of Matter

- 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.)

### Crosscutting Concepts

#### Scale, Proportion, and Quantity

- Standard units are used to measure and describe physical quantities such as weight, time, temperature, and volume.

### Observable features of the student performance by the end of the grade:

1	Identifying the phenomenon under investigation
a	From the given investigation plan, students identify the phenomenon under investigation, which includes the observable and measurable properties of materials.
b	Students identify the purpose of the investigation, which includes collecting data to serve as the basis for evidence for an explanation about the idea that materials can be identified based on their observable and measurable properties.
2	Identifying the evidence to address the purpose of the investigation
a	From the given investigation plan, students describe* the evidence from data (e.g., qualitative observations and measurements) that will be collected, including: <ul style="list-style-type: none"> <li>i. Properties of materials that can be used to identify those materials (e.g., color, hardness, reflectivity, electrical conductivity, thermal conductivity, response to magnetic forces, and solubility).</li> </ul>
b	Students describe* how the observations and measurements will provide the data necessary to address the purpose of the investigation.
3	Planning the investigation
a	From the given plan investigation plan, students describe* how the data will be collected. Examples could include: <ul style="list-style-type: none"> <li>i. Quantitative measures of properties, in standard units (e.g., grams, liters).</li> <li>ii. Observations of properties such as color, conductivity, and reflectivity.</li> <li>iii. Determination of conductors vs. nonconductors and magnetic vs. nonmagnetic materials.</li> </ul>
b	Students describe* how the observations and measurements they make will allow them to identify materials based on their properties.
4	Collecting the data
a	Students collect and record data, according to the given investigation plan.