

5-PS1-1 Matter and Its Interactions

Students who demonstrate understanding can:

- 5-PS1-1. Develop a model to describe that matter is made of particles too small to be seen.** [Clarification Statement: Examples of evidence supporting a model could include adding air to expand a basketball, compressing air in a syringe, dissolving sugar in water, and evaporating salt water.] [Assessment Boundary: Assessment does not include the atomic-scale mechanism of evaporation and condensation or defining the unseen particles.]

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

Developing and Using Models

Modeling in 3–5 builds on K–2 experiences and progresses to building and revising simple models and using models to represent events and design solutions.

- Use models to describe phenomena.

Disciplinary Core Ideas

PS1.A: Structure and Properties of Matter

- Matter of any type can be subdivided into particles that are too small to see, but even then the matter still exists and can be detected by other means. A model showing that gases are made from matter particles that are too small to see and are moving freely around in space can explain many observations, including the inflation and shape of a balloon and the effects of air on larger particles or objects.

Crosscutting Concepts

Scale, Proportion, and Quantity

- Natural objects exist from the very small to the immensely large.

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

1	Components of the model
a	Students develop a model to describe* a phenomenon that includes the idea that matter is made of particles too small to be seen. In the model, students identify the relevant components for the phenomenon, including: <ol style="list-style-type: none"> Bulk matter (macroscopic observable matter; e.g., as sugar, air, water). Particles of matter that are too small to be seen.
2	Relationships
a	In the model, students identify and describe* relevant relationships between components, including the relationships between: <ol style="list-style-type: none"> Bulk matter and tiny particles that cannot be seen (e.g., tiny particles of matter that cannot be seen make up bulk matter). The behavior of a collection of many tiny particles of matter and observable phenomena involving bulk matter (e.g., an expanding balloon, evaporating liquids, substances that dissolve in a solvent, effects of wind).
3	Connections
a	Students use the model to describe* how matter composed of tiny particles too small to be seen can account for observable phenomena (e.g., air inflating a basketball, ice melting into water).