

Educational Resources from *Phenomenon Science Education*
Student Proficiency Goals for Performance Expectation **5-PS1-1**



Information about Performance Expectation 5-PS1-1

Performance Expectation 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 Limits.

Assessment does not include the atomic-scale mechanism of evaporation and condensation or defining the unseen particles.

Science and Engineering Practice (Developing and Using Models)

- Develop a model to describe phenomena.

Disciplinary Core Idea (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 Concept (Scale, Proportion, and Quantity)

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

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SEP (Developing and Using Models):

- With guidance, students develop physical and/or conceptual models capable of addressing phenomena related to the particle nature of matter.
- With guidance, students identify components needed for models that can address phenomena related to the particle nature of matter and identify the roles of those components within the models.
- Students use their models to address phenomena related to the particle nature of matter and to identify relationships among particles in matter.

DCI (PS1.A Structure and Properties of Matter):

- Students know the particles that make up matter cannot be directly seen because those particles are too small. However, students know the particles exist because the particles can be detected in ways that students can observe.
- Students know that particles of matter can act on other particles of matter, resulting in events that are observable, even though the particles themselves cannot be directly observed.
- Students infer that all matter is made of particles.

CCC (Scale, Proportion, and Quantity):

- Students consider concepts of particle scale in models that explore phenomena related to the behavior of particles in matter, using this perspective to make better sense of those phenomena.
- Students consider characteristics related to the behavior of particles that can be observed and/or measured (e.g., mass), and how those characteristics can provide evidence of the particle nature of matter.