

Physical Science - Middle School

Properties of Matter

Scenario Guide
Activation Date:
Intensity Level: Low

Author(s)	Avatar(s) & Environment	Suggested Learner Audience
Simulations for Secondary Science Teachers Conference Shanna Hays Tori McPetrie Dr. Robert Moody Dr. Andrea Ridley Mursion Jessica Gasparolo	Host Avatar(s) Nina/Michael Simulation Avatars Savannah, Dev, Ava, Jasmine, Ethan Environment [ML3z] Middle School-8th Grade Classroom	<ul style="list-style-type: none">• Teachers• Non-credentialed Teachers• Pre-service Teachers
Delivery Mode(s) Available for Scheduling 1:1, Facilitated Group		
This scenario was created in partnership with AACTE and the convening, Enhancing Science Education through Virtual Reality: A Conference to Design Simulations that Enhance the Clinical Preparation of Secondary Science Teachers, is funded by the National Science Foundation (NSF) 20-572 Discovery Research PreK-12, award #2040747.		

Learner-Facing Vignette:

You are a middle school science teacher, and you are continuing a unit on the three properties of matter with your students. For today's lesson, you will lead a class discussion beginning with the prompt question "Which is the densest: ice, water or steam?" During the class discussion, ask the students to reference the pre-loaded worksheet on their tablets, which details the molecular structures of the three properties of matter. Encourage the students to expand and build on their hypotheses as a group in order to come to a class consensus.

Outcome:

Your goal in this scenario is to use higher-order thinking questions to lead student discussion about the basics of molecular structure and density.

Strategies/Best practices to consider:

- Use higher-order thinking questions to engage the entire class critically on the topic
- Ask students to provide explanations for their assumptions
- Encourage students to engage in investigative planning

Information about Intensity Range:

- Low intensity sessions are meant to build confidence for the learner. This setting is recommended for first time learners.

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Supplemental Materials:

Students Prior Knowledge:

The three properties of matter. Outside of this the students may have limited to no prior knowledge.

This scenario is gearing toward practicing the following of the
[Next Generation Science Standards 8 Practices of Science & Engineering](#):¹

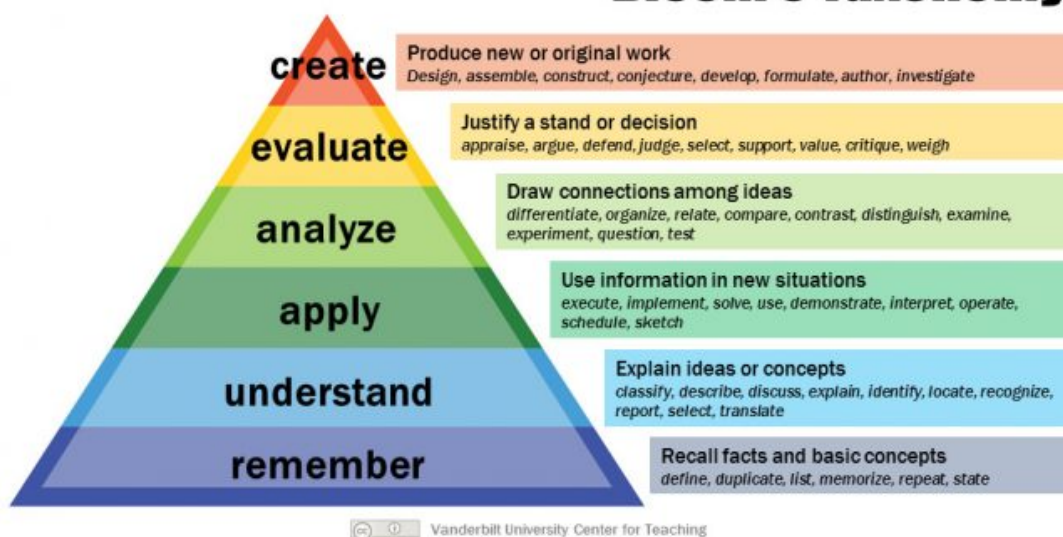
Asking Questions & Defining Problems

A practice of science is to ask and refine questions that lead to descriptions and explanations of how the natural and designed world works and which can be empirically tested.

Obtaining, Evaluating, and Communicating Information

Scientists and engineers must be able to communicate clearly and persuasively the ideas and methods they generate. Critiquing and communicating ideas individually and in groups is a critical professional activity.

Bloom's Taxonomy

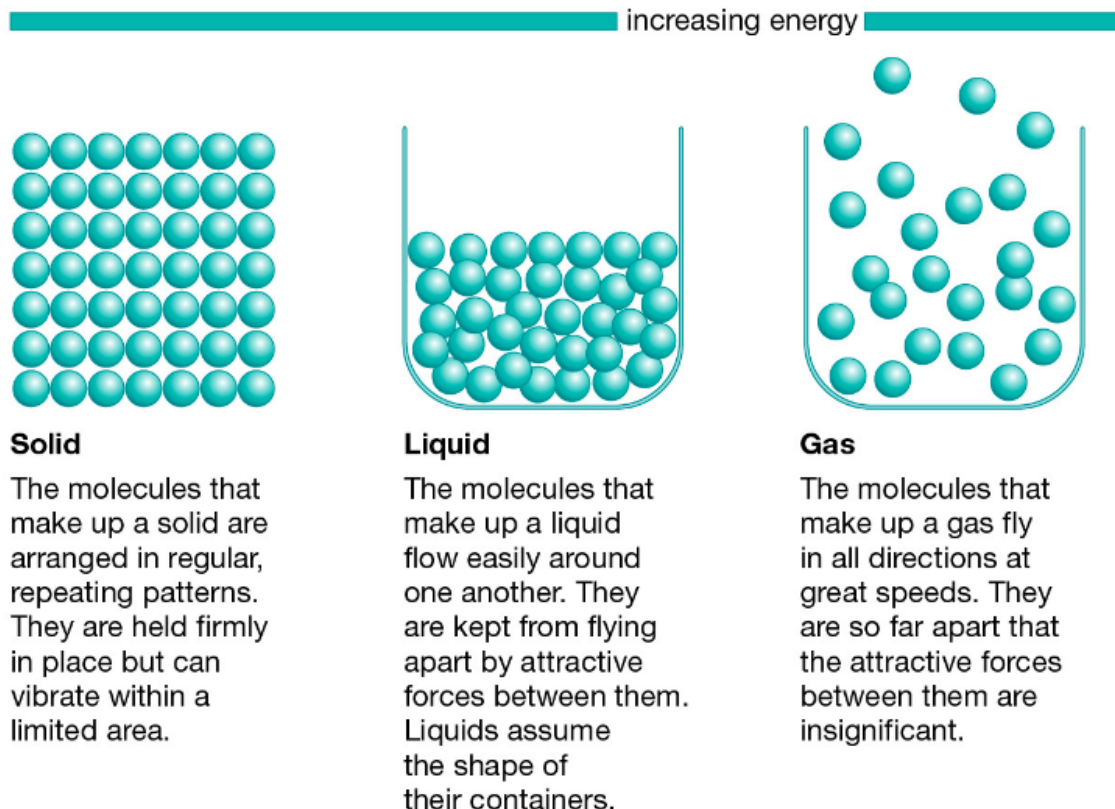


¹ NSTA, and using information from Appendix F of the Next Generation Science Standards © 2011, 2012, 2013 Achieve, Inc. "Science and Engineering Practices." *National Science Teaching Association*, 2014, <https://ngss.nsta.org/practicesfull.aspx>. Accessed 10 8 2021.

Student Handout:

Use the Handout to inform your discussion.

Physical states



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