

5th Grade - Lesson 2.3

Mixing Liquids to Identify an Unknown Liquid

NGSS Alignment

Performance Expectations

5-PS1-1. Develop a model to describe that matter is made of particles too small to be seen.

5-PS1-3. Make observations and measurements to identify materials based on their properties.

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. (5-PS1-1)
- Measurements of a variety of properties can be used to identify materials. (5-PS1-3)

Students observe the difference in the way water, salt water, alcohol, and detergent solution all colored yellow mix with plain water, colored blue. Students use this property of different mixing to help identify each substance. An explanation is developed that the atoms and molecules that make up the substances are different and their interaction with water molecules makes them mix differently. These phenomena, observations, and explanations help students develop an understanding that matter is made from particles that are too small to be seen and that the properties of substances can be used to identify them.

Science and Engineering Practices

Developing and Using Models

- Develop a model to describe phenomena. (5-PS1-1)

After seeing the water, salt water, alcohol, and detergent solution mix with water differently, a molecular model is used to show the different ions and molecules that make up each liquid. Students see that since the substances are made from different ions and molecules, water interacts with them differently so they mix with water differently.

Crosscutting Concepts

Scale, Proportion, and Quantity

- Natural objects exist from the very small to the immensely large. (5-PS1-1)
Students see that their macroscopic observations of water mixing with the four liquids can be explained on the sub-microscopic molecular level.

Cause and Effect

- Cause and effect relationships are routinely identified, tested, and used to explain change.

Students use molecular-level models to explain how the interactions of water molecules with the ions and molecules of the different liquids cause the liquids to mix with water differently.