

Photo Description



This image shows a kitchen science setup with dry ingredients (like cinnamon and sugar) in a white bowl with a whisk, and a red liquid (likely food coloring or tomato sauce) being mixed in a KitchenAid mixer. These are everyday examples of combining materials to create mixtures—a fundamental concept in understanding how substances can be put together while keeping their basic properties.

Scientific Phenomena

Anchoring Phenomenon: Creating mixtures by combining dry and liquid ingredients.

When dry materials (like cinnamon and sugar) are combined with liquids (like food coloring or sauce), the particles of each substance become distributed throughout the other. This is a physical change because no new substance is created—the ingredients can still be separated if needed. The visible color change and texture change are observable signs that mixing has occurred, but the sugar is still sugar and the cinnamon is still cinnamon; they're simply combined together in a new arrangement.

Core Science Concepts

- * **Mixtures:** A combination of two or more materials that are physically blended together but keep their individual properties. Each ingredient in a mixture maintains its own characteristics.
- * **Physical Changes:** Changes in the appearance or form of a material that do NOT create a new substance. Mixing is a physical change because the original materials can be separated again.
- * **Particle Model:** All matter is made of tiny particles. When we mix ingredients, we're distributing these particles throughout another material, creating a more uniform combination.
- * **Observable Properties:** We can describe and measure the appearance, texture, color, and consistency of mixtures. These observations help us understand what happens when materials combine.

Pedagogical Tip:

Use the familiar context of cooking or baking to anchor this lesson. Students already have intuitive knowledge about mixing ingredients—leverage this prior experience to make abstract particle concepts concrete and relatable. Have students predict what will happen before mixing to build scientific thinking habits.

UDL Suggestions:

Provide multiple means of engagement by offering choice: students can mix liquids and solids, solids and solids, or liquids and liquids. Offer visual demonstrations alongside tactile experiences. Allow students to record observations through drawings, words, or videos to honor different learning preferences and communication styles.

Discussion Questions

1. "If you mixed salt into water until you couldn't see the salt anymore, do you think the salt is still there? How could you prove it?"

(Bloom's: Analyze | DOK: 3)

2. "What do you notice about how the red liquid spreads through the bowl? Why might that happen if we think about tiny invisible particles?"

(Bloom's: Evaluate | DOK: 2)

3. "Compare mixing cinnamon into sugar with mixing paint colors together. How are they the same? How are they different?"

(Bloom's: Compare | DOK: 3)

4. "If we separated all the cinnamon particles back out of the mixture, would we still have the same amount of cinnamon we started with?"

(Bloom's: Understand | DOK: 2)

Extension Activities

Activity 1: Mixtures vs. Solutions Investigation

Have students create different types of mixtures: sand and water (mixture that separates), salt and water (solution where salt dissolves), and oil and water (mixture that separates). Students predict whether each mixture will separate and test by letting them sit overnight. This deepens understanding that not all mixtures behave the same way.

Activity 2: Reversible Changes Exploration

Using safe, food-grade materials, challenge students to create a mixture, then reverse it. For example, mix cocoa powder into water, then use a filter to separate the cocoa. Discuss: "Can we always separate a mixture back into its original parts?" This connects to the reversibility of physical changes.

Activity 3: Kitchen Chemistry Hunt

Have students identify 5-7 mixtures in their kitchen at home (trail mix, salad dressing, cereal and milk, seasoning blends, etc.). They photograph or sketch each one and label the individual materials they can see. Share findings in class to show that mixtures are everywhere in everyday life.

NGSS Connections

Performance Expectation:

5-PS1-1: Develop a model to describe that matter is made of particles too small to be seen and that these particles are in constant motion.

Disciplinary Core Ideas:

* 5-PS1.A Properties of Matter—Matter of any type can be subdivided into particles that are too small to see, but the matter still exists and can be detected by other means.

* 5-PS1.B Chemical Reactions—When two or more different substances are mixed, a new substance with different properties may be formed; physical mixing of materials results in different properties than either original material.

Crosscutting Concepts:

* Patterns - Observable patterns in mixtures help us predict what will happen when we combine different materials

* Structure and Function - The properties of the individual materials determine how they behave when mixed

Science Vocabulary

- * Mixture: A combination of two or more materials mixed together that keeps the properties of each original material.
- * Physical Change: A change in how something looks or feels, but the material stays the same kind of matter.
- * Particle: A tiny, tiny piece of matter so small we cannot see it without special tools.
- * Distribute: To spread something out evenly across an area or throughout another material.
- * Substance: A specific type of matter with its own particular properties, like salt, sugar, or water.

External Resources

Children's Books:

Mixing Colors* by Rebecca Olien (Simple Sight Word Books) - Explores how colors mix together

What Is a Mixture?* by Jennifer Boothroyd (Lerner Publishing) - Directly addresses the concept with age-appropriate photos

The Magic School Bus Goes Microscopic* by Joanna Cole - Explores the particle nature of matter in an engaging narrative

YouTube Videos:

* "Mixtures and Solutions for Kids" by Kids Academy - A 4-minute animated introduction to mixtures with clear examples.
<https://www.youtube.com/watch?v=OX3ULUN0o6c>

* "Physical and Chemical Changes" by Amoeba Sisters - A 9-minute video distinguishing between physical changes (like mixing) and chemical changes, with engaging visuals and relatable examples. https://www.youtube.com/watch?v=Nte_lxQzzjc