Mixtures

Physical Science | Lesson Guide

1st Grade

Photo Description

This image shows a baking or cooking activity in progress with two bowls: one contains dry, brown ingredients (like flour or sugar mixed with spices) and a whisk, while the other holds a bright red liquid (likely food coloring or tomato sauce). A KitchenAid mixer and various baking supplies are visible on the wooden counter. This is a real-world example of combining different materials to make something new.

Scientific Phenomena

Anchoring Phenomenon: When we mix different materials together (solids and liquids), they combine to create new mixtures with different properties.

Scientific Explanation: This image demonstrates that materials can be combined in different ways. When dry ingredients (powders, granules) are mixed together, they stay separate but occupy the same space. When liquids are added, the particles rearrange and blend, creating a new substance. This is a physical change—the individual materials don't transform into something completely different; they simply combine. Students can observe that the texture, color, and consistency change when materials mix, helping them understand that properties matter when combining things.

Core Science Concepts

* Mixtures: When two or more materials are put together, they can make a mixture. The materials in a mixture can often be separated again.

* Properties of Materials: Different materials have different properties (color, texture, wetness/dryness). When we mix materials, some properties change and become visible in new ways.

* Combining vs. Separating: Materials can be mixed together and, in many cases, separated back into their original forms. For example, sand and water can be mixed, and then separated by filtering or evaporating.

* Physical Changes: Mixing is a physical change because the materials don't become brand new substances—they just combine in new ways.

Pedagogical Tip:

For First Grade, focus on observable changes rather than molecular explanations. Use sensory language: "What do you see? What would it feel like? What color is it now?" This keeps the learning concrete and developmentally appropriate while building vocabulary for describing properties.

UDL Suggestions:

Multiple Means of Representation: Provide actual materials to mix (flour, water, salt, food coloring) so students can see AND touch the changes. Use before/after pictures or anchor charts with photos showing dry ingredients separately, then mixed together.

Multiple Means of Action & Expression: Allow students to mix materials themselves (hands-on), draw pictures of what happened, or use a simple sorting activity to identify which items are mixtures and which are single materials.

Multiple Means of Engagement: Connect mixing to familiar, joyful activities: making playdough, cooking snacks, or creating art. Let students choose which safe materials they'd like to combine.

Zoom In / Zoom Out

Zoom In (Microscopic Level):
When we mix flour and spices together, we can't see it with our eyes, but tiny particles of each ingredient are spreading out and sitting next to each other. When we add the red liquid, the liquid particles slip in between the dry particles, coating them and making everything stick together differently. The individual grains of flour are still there—they haven't disappeared—but now they're wet and clumpy instead of dry and powdery. This is what's happening at a size too small for us to see!

Zoom Out (Real-World System):
Mixing ingredients is part of a bigger process called cooking and baking, which happens in kitchens all around the world every day. When families, restaurants, and bakeries combine ingredients, they're feeding communities and creating traditions. The food we eat is almost always a mixture—bread is a mixture of flour, water, salt, and yeast; soup is a mixture of vegetables, broth, and spices; juice is a mixture of water and fruit. Understanding how to combine materials safely and effectively is how people create nourishing food for everyone!

Discussion Questions

1. What happened when we mixed the dry ingredients together? (Bloom's: Remember | DOK: 1)
   This checks if students can recall what they observed.

2. How did the mixture look and feel different after we added the liquid? (Bloom's: Understand | DOK: 2)
   This asks students to describe changes in properties using evidence.

3. If we poured this mixture into a clear cup and left it sitting, what do you think might happen over time? (Bloom's: Analyze | DOK: 2)
   This encourages prediction based on prior knowledge and observation.

4. How could we separate this mixture back into its parts? (Bloom's: Evaluate | DOK: 3)
   This extends thinking to real-world problem-solving.

Potential Student Misconceptions

Misconception 1: "When I mix things together, they disappear or turn into something completely brand new."
* Clarification: The materials don't disappear—they're still there, just mixed together! The flour is still flour; the water is still water. They've just combined to look and feel different. We could separate them again (though it might be tricky).

Misconception 2: "If something is wet now, it will always be wet."
* Clarification: Materials can change from wet to dry and back again! If we let a wet mixture sit in the sun or in an oven, the water can evaporate and the mixture becomes dry again. This is still a physical change—nothing disappears forever.

Misconception 3: "All mixtures look the same—they're just mush."
* Clarification: Mixtures can look very different from each other! Trail mix looks like separate pieces you can still see. Fruit juice looks smooth and uniform. Peanut butter looks thick and spreadable. Each mixture has its own special appearance and texture depending on what was combined.

Extension Activities

1. Edible Mixtures Tasting (with parent permission): Have students make simple, no-cook mixtures: mix cereal in yogurt, combine fruit in a bowl, or stir cocoa powder into milk. Discuss how the mixture tastes and looks different from the individual ingredients. Safety: Always check for allergies; keep activities hygienic.

2. Sink-or-Stir Sorting Game: Provide materials like rice, beads, water, oil, sugar, and salt. Ask students to predict which materials will mix with water ("Will it stir in?") and which will sink or float separately. Test predictions and record results on a simple chart with pictures.

3. Playdough Creation: Combine flour, salt, water, and food coloring to make playdough. While mixing, have students describe what's happening: "It's crumbly! Now it's sticky! Now it's smooth!" This sensory experience builds understanding that mixing changes how materials feel and look.

Cross-Curricular Ideas

Math Connection - Measurement & Quantities:
Have students measure dry ingredients using measuring cups or spoons, then record "before" and "after" amounts. They'll notice that when flour and sugar are mixed, they still take up the same total space. Create a simple bar graph showing "Cups of Flour," "Cups of Spice," and "Total Cups of Dry Mix." This builds understanding of addition and volume in a concrete, hands-on way.

ELA Connection - Descriptive Writing & Sequencing:
Students draw and label a picture sequence of the mixing process (dry ingredients !' add liquid !' stir !' final mixture). Have them dictate or write simple sentences using descriptive words: "First, the flour was brown and crumbly. Then, we added red sauce. Now, it is pink and sticky!" This builds vocabulary for properties and introduces procedural/sequential writing.

Art Connection - Color Mixing & Observation:
Use this photo as inspiration for an art exploration where students mix food coloring with water or paint to create new colors. Ask, "What color do you get when you mix red and yellow?" Students can paint their color-mixing results and compare to their predictions. This shows that mixing changes properties in visible, beautiful ways!

Social Studies Connection - Family Traditions & Culture:
Invite students to talk about mixing activities in their homes: "What do your families mix together when they cook or bake?" Have them draw a picture of a favorite family food that's a mixture (pizza, tacos, soup, smoothies). Create a class book titled "Our Favorite Family Mixtures," celebrating how different cultures combine ingredients in special ways. This builds community, validates home experiences, and shows that science happens in everyday family life.

STEM Career Connection

Chef or Baker
A chef or baker mixes many different ingredients together to create delicious meals and treats! They know exactly which ingredients to combine, how much of each to use, and in what order to mix them so the food tastes amazing and looks beautiful. Bakers especially use science every day—they have to understand how flour, water, sugar, and eggs combine to make bread rise or how to mix colors together with food coloring to decorate cakes.
Average Annual Salary: $32,000 - $42,000 USD

Food Scientist
A food scientist is a person who studies what happens when different ingredients are mixed together. They figure out how to make food healthier, how to keep it fresh longer, and how to create new flavors and textures that people will love. They use science and creativity to invent new foods and make sure the foods we eat are safe and delicious!
Average Annual Salary: $70,000 - $85,000 USD

Chemical Engineer

A chemical engineer uses science to mix materials and create new substances. While some work with food and cooking, others mix chemicals to make medicines, paints, plastics, and cleaning products. They need to understand exactly what happens when different materials combine so they can solve problems and create useful things for people.
Average Annual Salary: $105,000 - $130,000 USD

NGSS Connections

Relevant Performance Expectation:
K-PS1-1: Plan and conduct investigations to provide evidence that vibrations make sound and that various materials can absorb sound, and that light can be reflected by a mirror, refracted by a lens, and absorbed by various materials. (Note: While this PE focuses on sound and light, the foundational understanding of materials and their properties is critical.)*

1-PS1-1: Use observations to construct an evidence-based account of how an object made of a small set of pieces can be disassembled and made into a new object. (This PE relates well to mixing and combining materials.)*

Disciplinary Core Ideas:
* K-PS1.A (Structure and Properties of Matter): Materials can be perceived through the senses in different ways.
* 1-PS1.B (Types of Interactions): Objects may go through a sequence of changes when different materials interact.

Crosscutting Concepts:
* Properties of Materials
* Cause and Effect

Science Vocabulary

* Mixture: When you put two or more materials together, they make a mixture.
* Ingredients: The different materials you use to make something (like flour, sugar, and eggs for a cake).
* Combine: To put things together to make something new.
* Properties: How something looks, feels, smells, or acts (like color, texture, or wetness).
* Separate: To take apart or pull things away from each other.
* Texture: How something feels when you touch it (bumpy, smooth, sticky, etc.).

External Resources

Ø=ÜÚ Children's Books
* Pancakes, Pancakes! by Eric Carle — Shows the ingredients and steps for making pancakes; wonderful visual for understanding how separate materials combine into a new food.
* The Snowy Day by Ezra Jack Keats — While not directly about mixtures, it shows ice (frozen water) as a material and how it changes when mixed with snow and touched.
* What Do You Do With a Kangaroo? by Merle Pein — Playful book about combining animals in funny ways; great for discussing how things change when put together.

Ø<ß¬ YouTube Videos
* "Mixing Ingredients" - Crash Course Kids (2:45)
A colorful, simple introduction to what happens when you mix different materials. Shows clear before-and-after examples.
https://www.youtube.com/watch?v=oO2HcIqhtYY

* "States of Matter for Kids" - Kids Learning Videos (4:12)

Uses everyday examples (like mixing juice and water) to show how materials interact. Bright visuals and child-friendly narration.

https://www.youtube.com/watch?v=KzbyJcp623A

Teacher Tip: This lesson naturally connects to kitchen science, art, and cooking activities. Consider partnering with a family science night where caregivers and students mix simple ingredients together—it builds community engagement and reinforces concepts at home!