

Photo Description



Blue color is mixing with water in a clear jar. The blue looks like clouds moving through the water. The color spreads out and makes pretty shapes.

Scientific Phenomena

This image represents the Anchoring Phenomenon of diffusion and mixing. The blue dye (likely food coloring) is dispersing through the water due to the random motion of molecules. The dye particles naturally spread from areas of high concentration to low concentration until they are evenly distributed throughout the water. This process occurs because molecules are constantly moving and colliding with each other, causing the colored substance to gradually mix with the clear water without any stirring or external force.

Core Science Concepts

1. Matter Movement: Liquids can mix together when they touch each other
2. Observable Properties: We can see how materials change when they combine
3. Patterns in Nature: Mixing happens in predictable ways that we can observe
4. Cause and Effect: Adding one material to another causes visible changes

Pedagogical Tip:

Use clear containers and different colored liquids to help students make predictions before observing. Ask them to draw what they think will happen before conducting the demonstration.

UDL Suggestions:

Provide multiple ways for students to document observations: drawing, verbal descriptions, or using simple comparison charts. Consider having students with different learning needs work in pairs to describe what they see to each other.

Zoom In / Zoom Out

1. Zoom In: Even though we can't see them, tiny particles called molecules are constantly moving and bumping into each other, which makes the blue color spread through the water
2. Zoom Out: This same mixing process happens everywhere in nature - when rivers meet oceans, when rain mixes with soil, and even when we stir chocolate into milk

Discussion Questions

1. What do you think will happen to the blue color after we wait longer? (Bloom's: Predict | DOK: 2)
2. How is this mixing like when you add sugar to water? (Bloom's: Compare | DOK: 2)
3. What would happen if we used hot water instead of cold water? (Bloom's: Hypothesize | DOK: 3)
4. Can you describe what you see happening step by step? (Bloom's: Describe | DOK: 1)

Potential Student Misconceptions

1. Misconception: "The color moves because someone is stirring it"
Clarification: The mixing happens by itself because tiny particles are always moving, even when we can't see the movement
2. Misconception: "The blue color disappears"
Clarification: The blue color is still there, it just spreads out so much that it looks lighter, but no color is lost

Cross-Curricular Ideas

1. Math - Patterns & Sequencing: Have students draw or photograph the blue dye at different time intervals (0 minutes, 2 minutes, 5 minutes, 10 minutes) and arrange them in order from darkest to lightest. This connects observable sequences to mathematical ordering skills.
2. ELA - Descriptive Writing & Vocabulary: Ask students to use sensory words to describe what they see: "The blue looks like clouds," "It spreads slowly," "The water turns light blue." Create a class word wall of describing words and use them to write simple sentences together.
3. Art - Color Mixing & Observation: Conduct the experiment with different food coloring colors (red, yellow, blue) in separate jars. Have students predict what new colors will form and paint or draw their predictions before revealing the results. This combines scientific observation with creative expression.
4. Social Studies - Daily Life Connection: Discuss where students see mixing happen in their homes and community: food preparation (mixing juice powder in water), laundry (soap in water), cooking (ingredients combining). Help them understand that science is part of everyday activities.

STEM Career Connection

1. Food Scientist: Food scientists experiment with colors, flavors, and ingredients to create yummy foods and drinks. They use mixing, just like in this experiment, to make sure everything tastes good and looks pretty. They work in factories, test kitchens, and laboratories. Average Salary: \$68,000
2. Water Treatment Specialist: These workers make sure our drinking water is clean and safe by testing it and mixing it with special chemicals that help remove dirt and germs—similar to how we're mixing the blue dye with water. They work at water plants in our communities. Average Salary: \$48,000
3. Chemist: Chemists study how different materials mix, change, and combine with each other. They conduct experiments like the one in this photo to understand how substances behave and create new materials. They work in laboratories and research centers. Average Salary: \$79,000

NGSS Connections

- Performance Expectation: 1-PS4-1: Plan and conduct investigations to provide evidence that vibrating materials can make sound and that sound can make materials vibrate
- Disciplinary Core Idea: 2-PS1.A - Different kinds of matter exist and many of them can be either solid or liquid
- Crosscutting Concept: Patterns - Patterns in the natural world can be observed and used as evidence

Science Vocabulary

- * Mix: When two or more things combine together
- * Liquid: Something that flows and takes the shape of its container
- * Observe: To look carefully and notice what happens
- * Spread: To move out in different directions
- * Properties: The way something looks, feels, or acts

External Resources

Children's Books:

- Mixing and Separating by David Dreier
- What Is a Liquid? by Robin Johnson
- Mix It Up! by Hervé Tullet