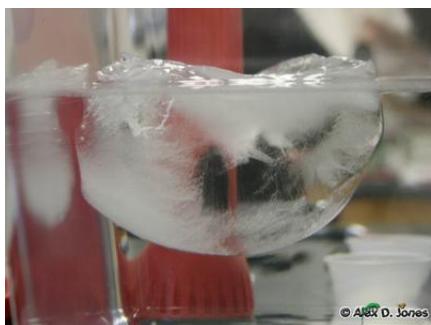


Photo Description



A clear glass has ice cubes floating in water. The ice looks white and cloudy inside the clear water. You can see bubbles or air trapped in the ice.

Scientific Phenomena

This image demonstrates the Anchoring Phenomenon of ice floating in water due to density differences. When water freezes into ice, it expands and becomes less dense than liquid water, causing it to float. The cloudy appearance in the ice is caused by trapped air bubbles that formed during the freezing process. This is a fundamental example of how the same substance (H_2O) behaves differently in different states of matter.

Core Science Concepts

1. States of Matter: Water exists as both liquid (water) and solid (ice) in the same container
2. Density and Buoyancy: Ice floats because it is less dense than liquid water
3. Physical Properties: Ice and water are the same substance but have different observable properties
4. Temperature Effects: Heat and cold can change matter from one state to another

Pedagogical Tip:

Use hands-on exploration with ice cubes in clear containers so students can make direct observations. Ask them to predict what will happen before adding ice to water, then observe together.

UDL Suggestions:

Provide multiple ways to engage with this concept: visual observation, tactile exploration of ice and water, and kinesthetic activities like acting out floating vs. sinking motions.

Zoom In / Zoom Out

1. Zoom In: At the molecular level, water molecules in ice form a crystalline structure with more space between them than in liquid water, making ice less dense and causing it to float.
2. Zoom Out: This same principle affects large bodies of water - ice forms on the surface of ponds and lakes in winter, creating an insulating layer that protects aquatic life below.

Discussion Questions

1. "What do you notice about where the ice is in the water?" (Bloom's: Observe | DOK: 1)
2. "Why do you think the ice stays on top instead of going to the bottom?" (Bloom's: Analyze | DOK: 2)
3. "What would happen if we left this glass sitting out for a long time?" (Bloom's: Predict | DOK: 2)
4. "How is the ice the same as the water? How is it different?" (Bloom's: Compare | DOK: 2)

Potential Student Misconceptions

1. Misconception: "Ice sinks because it's hard and heavy"
Reality: Ice floats because it takes up more space than the same amount of water, making it lighter per volume
2. Misconception: "Ice and water are completely different things"
Reality: Ice and water are the same substance (water) in different states
3. Misconception: "All solids sink in liquids"
Reality: Whether something floats depends on density, not just whether it's solid or liquid

Cross-Curricular Ideas

1. Math - Counting & Measurement: Count the ice cubes in the glass together. Use non-standard units (like finger widths) to measure how much the water level rises. Create a simple graph showing "floats" vs. "sinks" as students test different objects in water.
2. ELA - Descriptive Language & Storytelling: Have students use sensory words to describe ice and water (cold, clear, hard, wet, slippery). Read books about winter and ice, then create a class story about an ice cube's journey from freezing to melting. Practice vocabulary through repetitive chants: "Ice is solid, water flows, watch the ice cube float!"
3. Art - Color & Texture Exploration: Create ice cube art by freezing water with food coloring in ice cube trays, then observing how colors blend as they melt in clear containers. Make collages with pictures of ice and water, or paint with ice cubes dipped in washable paint to explore texture and movement.
4. Social Studies - Seasonal Awareness: Connect ice and freezing to winter experiences in your community. Discuss how people, animals, and plants prepare for cold weather. If your region has winter, take a winter walk to observe frozen water in nature. If not, use photos to explore how ice affects different communities around the world.

STEM Career Connection

1. Meteorologist (Weather Scientist): Meteorologists study weather and ice! They observe rain, snow, hail, and ice to help predict the weather and keep people safe. They use special tools to measure temperature and watch how water freezes in clouds. Average Salary: \$97,300/year
2. Materials Scientist: Materials scientists study how substances like water change and behave in different ways. They explore why ice floats, how materials freeze and melt, and create new materials for useful products. They work in laboratories conducting cool experiments! Average Salary: \$101,000/year
3. Glaciologist (Ice Expert): Glaciologists study giant ice mountains called glaciers and ice sheets in cold places like Antarctica. They investigate how ice forms, moves, and melts to understand our planet and climate. It's like being a detective for ice! Average Salary: \$84,000/year

NGSS Connections

- Performance Expectation: K-PS1-1 - Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties
- Disciplinary Core Ideas: K-PS1.A - Objects can be described in terms of the materials they are made of and their physical properties
- Crosscutting Concepts: Patterns - Patterns in the natural world can be observed and used as evidence

Science Vocabulary

- * Float: To stay on top of water instead of sinking down
- * Solid: Matter that holds its shape, like ice cubes
- * Liquid: Matter that flows and takes the shape of its container, like water
- * Melt: When something solid turns into a liquid because it gets warmer
- * Freeze: When liquid water gets so cold it turns into solid ice

External Resources

Children's Books:

- Water is Water by Miranda Paul
- The Magic School Bus Wet All Over by Joanna Cole
- Ice is Nice by Robin Nelson