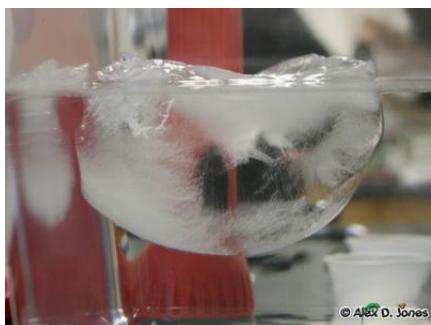


## Photo Description



## 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

## 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

### YouTube Videos:

- "States of Matter for Kids" - Simple explanation of solid, liquid, and gas with animations (<https://www.youtube.com/watch?v=ZjNs6uhdwW8>)
- "Why Does Ice Float?" - Kid-friendly explanation with visual demonstrations (<https://www.youtube.com/watch?v=UukRgaEXUv0>)