

Photo Description



A big ship floats on water. The ship has a red bottom and dark top. It is very long and has tall parts that stick up.

Scientific Phenomena

This image shows the Anchoring Phenomenon of buoyancy - how heavy objects can float on water. The massive cargo ship floats because it displaces (pushes away) a volume of water that weighs more than the ship itself. Even though the ship is made of heavy metal, its hollow design traps air, making its overall density less than water, allowing it to stay afloat.

Core Science Concepts

1. Floating and Sinking: Objects float when they are less dense than water, even if they are made of heavy materials like metal
2. Forces: The water pushes up on the ship (buoyant force) while gravity pulls the ship down
3. Materials and Properties: Ships are made of metal but designed with hollow spaces filled with air
4. Size and Scale: Very large objects can still float if they are designed properly

Pedagogical Tip:

Use a variety of objects in water play to let students discover that size doesn't always determine if something floats - a large beach ball floats while a small marble sinks!

UDL Suggestions:

Provide hands-on water exploration stations with different materials (wood blocks, plastic toys, metal spoons, foam) so students can physically test and observe floating and sinking through multiple senses.

Zoom In / Zoom Out

1. Zoom In: Water molecules push against every surface of the ship's hull, creating upward pressure that supports the ship's weight
2. Zoom Out: This ship is part of a global transportation system that moves goods across oceans, connecting communities worldwide and affecting ocean ecosystems

Discussion Questions

1. What do you think would happen if we put different objects in water? (Bloom's: Predict | DOK: 2)
2. How is this big ship able to float when a small rock sinks? (Bloom's: Analyze | DOK: 3)

3. What materials do you see on this ship? (Bloom's: Observe | DOK: 1)
4. Why might people build ships to float on water? (Bloom's: Evaluate | DOK: 2)

Potential Student Misconceptions

1. Misconception: "Heavy things always sink"
Clarification: Heavy things can float if they are designed to displace enough water, like this metal ship
2. Misconception: "Big things can't float"
Clarification: Size doesn't determine floating - it's about how much water the object pushes away compared to its weight
3. Misconception: "Only wood floats"
Clarification: Many materials can float, including metal objects if they have the right shape and air spaces

NGSS Connections

- Performance Expectation: K-2-ETS1-1: Ask questions, make observations, and gather information about a situation people want to change
- Disciplinary Core Ideas: 2-PS1.A - Different kinds of matter exist and many can be solid or liquid
- Crosscutting Concepts: Patterns - Patterns in the natural world can be observed

Science Vocabulary

- * Float: To stay on top of water without sinking
- * Sink: To go down under the water
- * Heavy: Something that weighs a lot
- * Ship: A big boat that carries things across water
- * Metal: A hard, strong material that ships are made from

External Resources

Children's Books:

- Who Sank the Boat? by Pamela Allen
- Things That Float and Things That Don't by David Adler
- Boats by Byron Barton

YouTube Videos:

- "Why do ships float?" by SciShow Kids - Simple explanation of buoyancy for young learners: https://www.youtube.com/watch?v=f2Wz6q0-a_w
- "Floating and Sinking" by Peekaboo Kidz - Interactive demonstration with various objects: https://www.youtube.com/watch?v=QnQe0xW_JY4