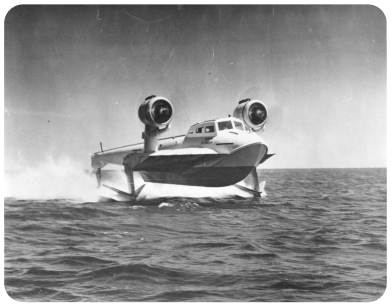
Marine Engineering: Meeting the needs of your environment

Prof. Katy Schulte Grahame's Cornerstone Students

How Do Boats Float?



Prof. Katy Schulte Grahame's Cornerstone Students

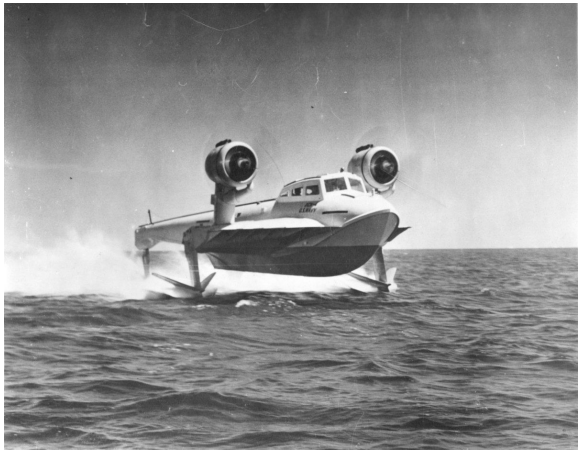
Beachmont Elementary - Revere

Rafael Hernández School

Marine Technology

Offshore Drilling

Offshore Wind Power



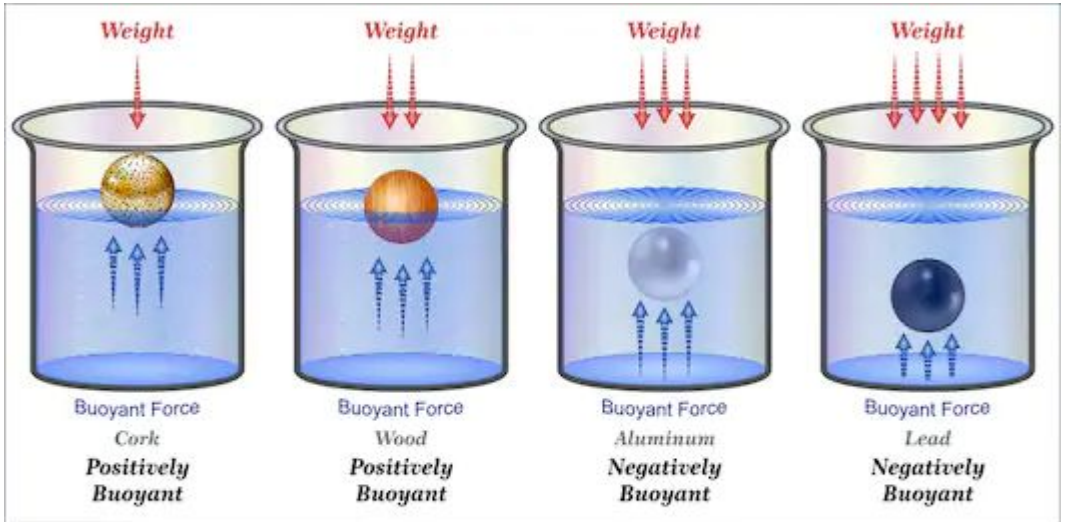
Hydrofoils

How Do Boats Float?

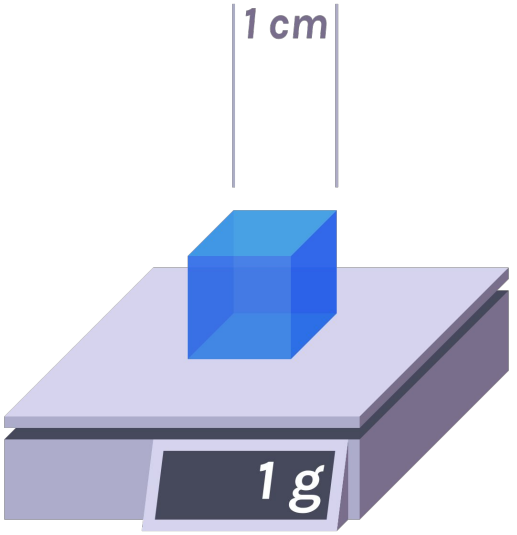
Buoyancy

If you can displace more weight in water than your object's weight, it will float!

Density = Mass / Volume

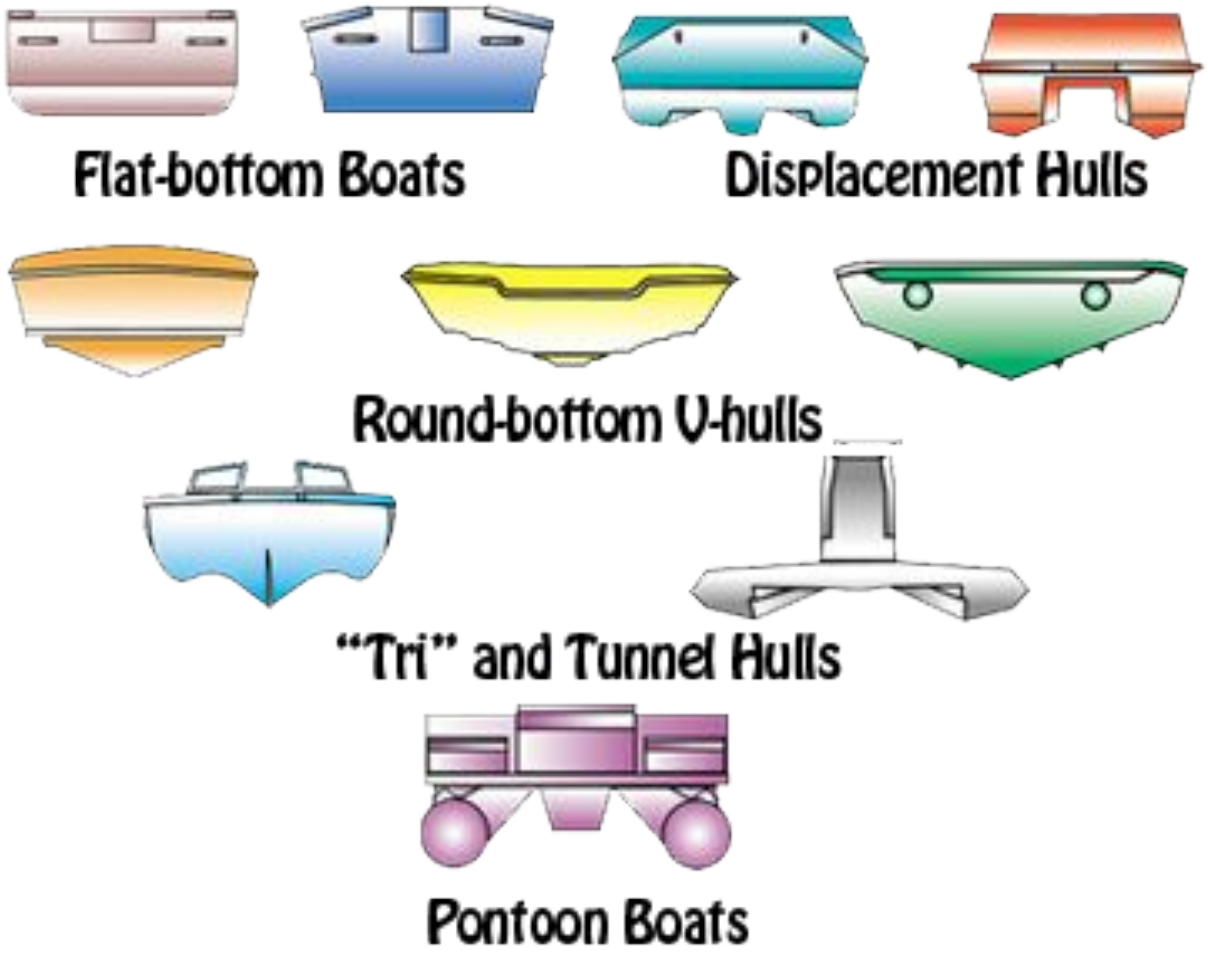


Water is quite dense!



Watch out for leaks!

Boat (Hull) Designs



More Considerations

- Water resistance
  - Bad: sponge, cloth, marshmallows
  - Good: wood, plastic, metal

- Fluid dynamics
  - How will different shapes travel through water?

- Corrosion resistance
  - Salt water can be particularly corrosive

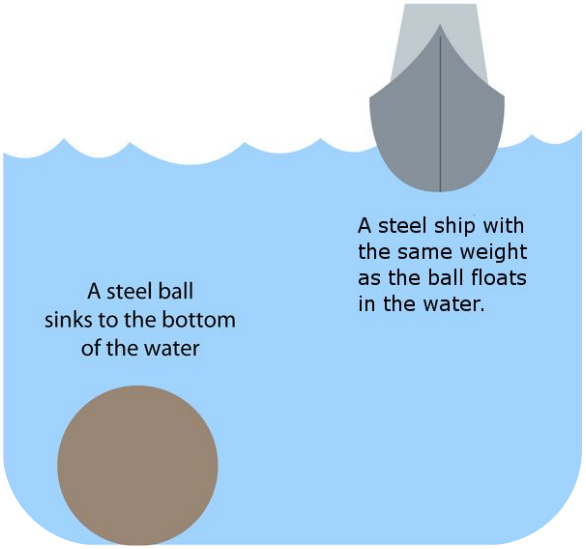
What does sticking your hand out of the window have to do with a dolphin's fin?

Your Task:

1. Shape your material around the **sail base** so that it may **displace as much water** as possible without leaking or sinking.
2. Design your boat to be propelled by the **fan.**

Extra Challenge!

- Hold as many **marbles** as possible without sinking



Materials:

- 2 blocks of clay
  - (Design + Redesign)
- 1 sail base
- 1 water bottle straw
- 1 piece of paper
- Tape