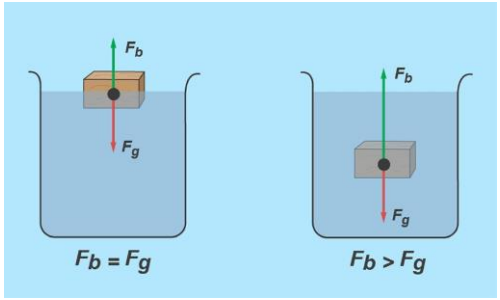
Flinkers 2.0

Fill a clear container with water.
Place a foam peanut in the water. What happens?
Attach paper clips and small washers to your peanut. Can you make it flink?
Experiment by changing your shape and weight distribution until it flinks for 10 seconds. Try a different material, such as a sponge.
Expansion:
What is the relationship between ∇ and Δ?
What is the maximum displacement (Δ_{max}) you can achieve without sinking your design?



Buoyancy

According to **Archimedes Principle**, an object partially or fully submerged in a fluid will experience a resultant vertical force pushing up on it equal to the weight of the volume of fluid displaced (Δ) by the object. This vertical force is called the **Force of Buoyancy** (F_B). The Buoyant Force on an object is equal to the weight of the volume of the water displaced by the object. When the weight of the object submerged is equal to the upward buoyant force exerted by the water, the object is **Neutrally Buoyant** so it neither sinks or floats, instead it flinks.

Eureka!

According to legend, Archimedes shouted "Eureka" when he deduced his famous principle. Mathematically, **Archimedes Principle** is

$F_B = \Delta = \rho g V$.

F_B is the *buoyant force*
Δ is the *displacement* of water in lbs
ρ is the *density of water* in lb-s^2/ft^4
(ρ = 1.94 lb-s^2/ft^4 for freshwater)
g is the *acceleration due to gravity* in ft/s^2 (g=32 ft/s^2)
∇ is the *submerged volume of the object* in ft^3
The formula may be rewritten as **$\nabla = \Delta/(\rho g)$**

NAVY NOTES

The displacement of the Los Angeles Class submarine the USS Annapolis is approximately 6,900 tons (7011 metric tons) submerged. ww.navy.mil/navydata