Density and Buoyancy

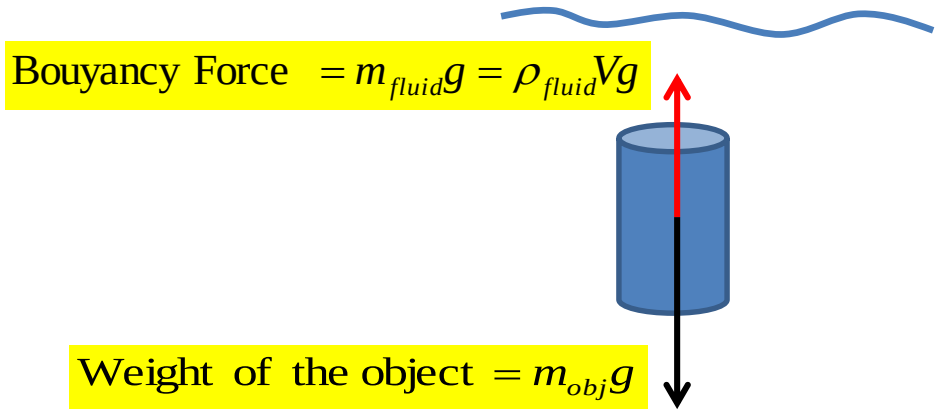
- **Density:**

$$Density = \frac{Mass}{Volume} \quad \text{or} \quad \rho = \frac{M}{V}$$

ρ is the Greek letter "rho" often used for density.

- **Archimedes Principle:** "*Any object, wholly or partially immersed in a fluid, is buoyed up by a force equal to the weight of the fluid displaced by the object.*"

"Buoyancy force = weight of the displaced fluid"



Homework Problem.

The table below shows masses **(m)** and dimensions (radius **R**, thickness **d**) of various US coins.

a) Derive a general formula for density ρ of the material from which a coin is made of. It should look like ρ = "some mathematical expression of m, R, and d".

b) Based on your formula, fill the missing densities in the table (in g/cm^3). Pay attention to units! Based on your results, could a penny be made of Copper? Nickel of Nickel?

Coin	penny	nickel	dime	quarter
R (cm)	0.95	1.06	0.90	1.53
d (mm)	1.55	1.95	1.35	1.75
m (g)	2.5	5.0	2.27	5.67
ρ (g/cm^3)				