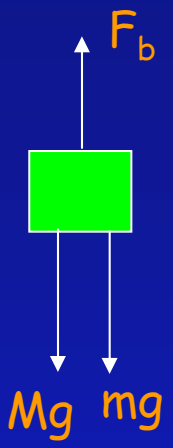
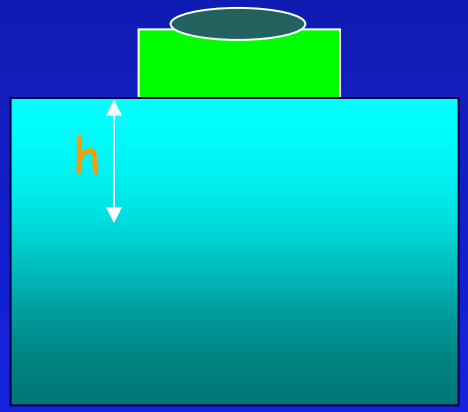
Archimedes Example

A cube of plastic 4.0 cm on a side with density = 0.8 g/cm^3 is floating in the water. When a 9 gram coin is placed on the block, how much does it sink below the water surface?





$\Sigma F = m a$

$F_b - Mg - mg = 0$

$\rho g V_{disp} = (M+m) g$

$V_{disp} = (M+m) / \rho$

$h A = (M+m) / \rho$

$h = (M + m)/ (\rho A)$

$= (51.2+9)/(1 \times 4 \times 4) = 3.76$ cm [coke demo]

$M = \rho_{plastic} V_{cube}$

$= 4x4x4x0.8$

$= 51.2\ g$