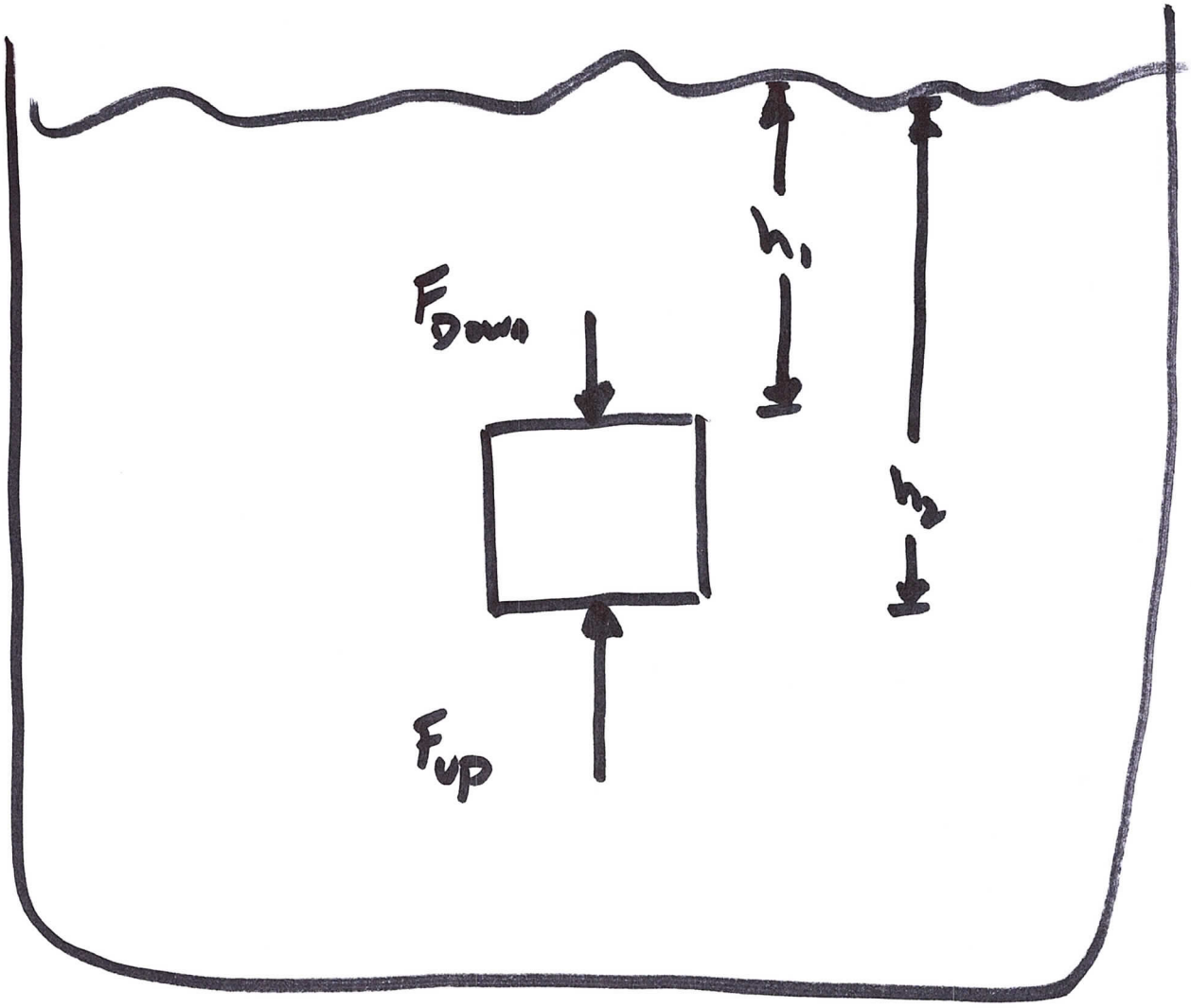
h_1
h_2
F_{Down}
F_{up}

$\Sigma F_{on} = ma$

consider object is not moving

$v = 0\ m/s$ and is constant

$\therefore a = 0\ m/s^2$

$\Sigma F_{on} = 0\ N$

$\underbrace{F_{up} + (-F_{Down})}_{\text{Buoyancy}} = 0\ N$

$F_{Buoyancy} = F_{up} - F_{Down}$

$= P_{up} A - P_{Down} A$

$= (P_{up} - P_{Down}) A$

Remember $P_{FLUID} = \rho g h$

$P_{DOWN} = \frac{F_{DOWN}}{Area}$ ← weight of fluid

$P_{UP} = \frac{F_{UP}}{Area}$

Buoyancy is a Force

↳ It is a result of different Pressures acting on object

$F_{DOWN} = P_{DOWN}\ Area$

$F_{UP} = P_{UP}\ Area$

Buoyancy is the difference in forces

$$= (\rho g h_1 - \rho g h_2) A$$

$$= \rho g A (h_1 - h_2)$$

$h_1 - h_2$: height of object

A: area $= l \times w$

$$= \rho g V$$

V: Volume

$$F_{Buoyancy} = \rho g V$$

$\rho g V$: weight of the water displaced by the object.