Exp#2: Conservation of linear Momentum

$\vec{P} = m\vec{V}$ → velocity
↙ linear Momentum
↘ Mass

- if there was N objects in an isolated system:- → No External resultant forces acts on it

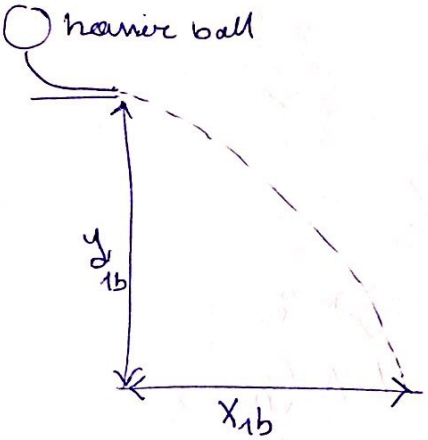
$$\vec{P} = \sum_{i=1}^{N} m_i \vec{v_i}$$

$\vec{P}$: is conserved for an isolated system

* Collision:-

$\vec{P}$ before collision $= \vec{P}$ after collision

$m_1 v_{1b} + \underbrace{m_2 v_{2b}}_{=0} = m_1 v_{1a} + m_2 v_{2a}$



Theory. $\frac{P_a}{P_b} = \frac{m_1 v_{1a} + m_2 v_{2a}}{m_1 v_{1b}} = 1$

$y_{1b} = \frac{1}{2} g t^2$

$t = \sqrt{\frac{2y}{g}}$

$v_b = \frac{x_b}{t_b} \Rightarrow V = \frac{x}{\sqrt{2yg}}$

$P_b = \frac{m_1 x_{1b}}{\sqrt{\frac{2y}{g}}}$ • t is equal for the ~~so~~ 2 balls before and after

$\frac{P_a}{P_b} = R = \frac{m_1 x_1 a + m_2 x_2 a}{m_1 x_{1b}} = \frac{A}{B}$

$\frac{\Delta R}{R} = \frac{\Delta A}{A} + \frac{\Delta B}{B} = \frac{m_1 \Delta x_{1a} + x_{1a} \Delta m_1 + m_2 \Delta x_{2a} + x_{2a} \Delta m_2}{m_1 x_1 a + m_2 x_2 a} + \frac{m_1 \Delta x_b + x_b \Delta m_1}{m_1 x_{1b}}$

Alaa Ehaimi