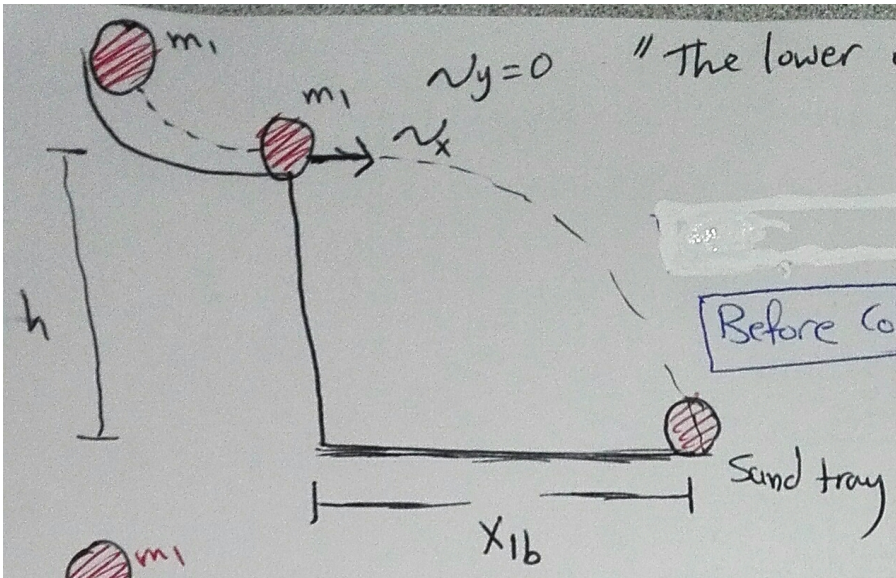
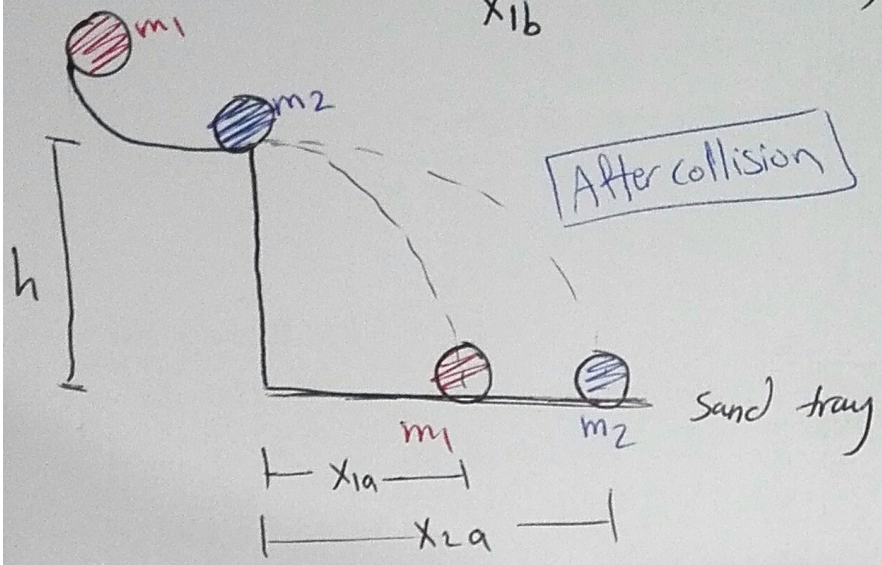


"The lower end of the track is horizontal"

$$\Rightarrow h = v_{y_0} t - \frac{1}{2} g t^2$$

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

$$v_{1b} = \frac{X_{1b}}{t}$$



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

$$v_{1a} = X_{1a} / t$$

$$v_{2a} = X_{2a} / t$$

$$R = \frac{m_1 \bar{X}_{1a} + m_2 \bar{X}_{2a}}{m_1 \bar{X}_{1b}}$$

Data

$m_1 = (\quad)g$

$m_2 = (\quad)g$

X_{1b}(cm)						
X_{1a}(cm)						
X_{2a}(cm)						

$$R = \frac{A}{B}$$

$$\Delta R = \left[\frac{\Delta A}{A} + \frac{\Delta B}{B}\right] R$$

$$\Rightarrow A = m_1 X_{1a} + m_2 X_{2a}$$

$$\Delta A = m_1 \Delta X_{1a} + X_{1a} \Delta m_1 + m_2 \Delta X_{2a} + X_{2a} \Delta m_2$$

$$B = m_1 X_{1b}$$

$$\Delta B = m_1 \Delta X_{1b} + X_{1b} \Delta m_1$$

$\bar{X}_{1b} \pm \sigma_{m_1, X_{1b}}$, $\Delta X_{1b} = \sigma_{m_1, X_{1b}}$

$\bar{X}_{1a} \pm \sigma_{m_1, X_{1a}}$, $\Delta X_{1a} = \sigma_{m_1, X_{1a}}$

$\bar{X}_{2a} \pm \sigma_{m_1, X_{2a}}$, $\Delta X_{2a} = \sigma_{m_1, X_{2a}}$

Experiment 2: Conservation of Linear Momentum

* Linear momentum ($\vec{P}$) , $\vec{P} = m\vec{v}$ [mass * velocity]

* System of (N- objects) $\vec{P} = \sum_{i=1}^{N} m_i \vec{v}_i$

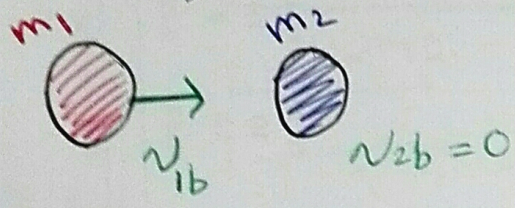
$$[\vec{P}] = Kg\,\frac{m}{s}$$

* Linear Momentum is conserved for an Isolated system

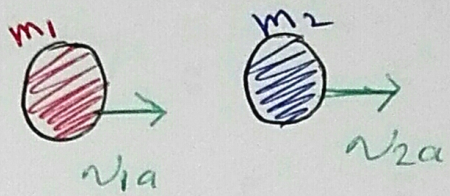
$\sum F_{ext} = 0$

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

Before



After



$m_1 > m_2$

$$\vec{P}_b = m_1 v_{1b} \quad , \vec{P}_b = m_1 v_{1a} + m_2 v_{2a}$$

$$R = \frac{\vec{P}_a}{\vec{P}_b} = 1$$

$$R = \frac{m_1 v_{1a} + m_2 v_{2a}}{m_1 v_{1b}}$$

$$\Rightarrow R_{exp} = \frac{m_1 \vec{X}_{1a} + m_2 \vec{X}_{2a}}{m_1 \vec{X}_{1b}} = \frac{A}{B}$$