- **Impact**

Conservation or Momentum (C.O.M.): $m_1u_1 + m_2u_2 = m_1v_1 + m_2v_2$

Coefficient or Restitution $e = (v_2 - v_1)/(u_1 - u_2) = -v/u$

Loss of K.E. = $\left[\frac{1}{2}m_1u_1^2 + \frac{1}{2}m_2u_2^2\right] - \left[\frac{1}{2}m_1v_1^2 + \frac{1}{2}m_2v_2^2\right]$

} (Assuming → +ve & ↑+ve)

**For Plastic Impact (e = 0):** We can't use 'e' C.O.M. becomes

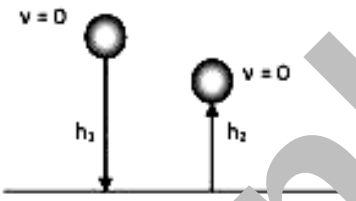
$m_1u_1 + m_2u_2 = (m_1 + m_2)v$

where $v = v_1 = v_2$, since both the bodies move together after Impact with same veloc.

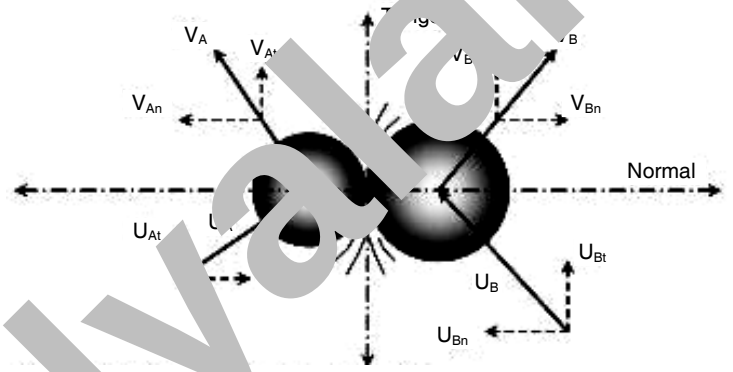
If a ball is released from a height $h_1$ and it bounces back to a height $h_2$ th

bounces back to a height $h_2$ then

$$e = \frac{\sqrt{2gh_2}}{2gh_1} = \sqrt{\frac{h_2}{h_1}}$$




**For oblique central Impact problems:**




**Tangential components remains same :** $V_B = U_B$ & $V_{At} = U_{At}$,

**Normal components :** By conservation of momentum

$m_A u_{An} + m_B u_{Ba} = m_A v_{an} + m_B v_{Ba}$ (→ +ve)

and Coefficient of Restitution (e) $e = (V_{Bn} - V_{An})/(U_{An} - U_{Bn})$ (→ +ve)

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