Conservation of Momentum Notes

Before:

$$\vec{p}_\circ = m_a v_{a\circ}$$

After (Elastic):

$$\vec{p}_f = m_a v_{af} + m_b v_{bf}$$

After (Inelastic):

$$\vec{p}_f = (m_a + m_b)\, v_f$$

$$E_{\text{total}} = KE_\circ = \frac{1}{2} m a v_{ao}^2$$

$$E_{\text{total}} = KE_f = \frac{1}{2} m_{v_{af}^2 + \frac{1}{2} m_b v_{bf}^2}$$