## Answer on Question #68519, Physics / Mechanics | Relativity

Two blocks of mass 300g & 200g are moving toward each other along a horizontal frictionless surface with velocities of 50cm/s and 100cm/s respectively. Find the loss of kinetic energy during the collision.

**Solution:**

The law of conservation of momentum for a system of two bodies

$$m_1 v_1 + m_2 v_2 = (m_1 + m_2)u$$

$$u = \frac{m_1 v_1 + m_2 v_2}{m_1 + m_2}$$

$$u = \frac{0.3\ kg \times 0.5\ m/s\ + 0.2\ kg \times 1\ m/s}{0.3\ kg + 0.2\ kg}$$

$$u = 0.7\ m/s$$

Define the difference of the kinetic energy of two bodies before and after the interaction

$$\Delta E = \left(\frac{m_1 v_1^2}{2} + \frac{m_2 v_2^2}{2}\right) - \frac{(m_1 + m_2)u^2}{2}$$

$$\Delta E = \left(\frac{0.3\ kg \times \left(0.5\frac{m}{s}\right)^2}{2} + \frac{0.2\ kg \times \left(1\frac{m}{s}\right)^2}{2}\right) - \frac{(0.3\ kg + 0.2\ kg)(0.7\frac{m}{s})^2}{2}$$

$$\Delta E = 0.015\ Joule$$

**Answer: $0.015$ Joule**