

Perfectly Inelastic Collisions

$$m_1 v_{1,i} + m_2 v_{2,i} = (m_1 + m_2) v_f$$

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A 1500 kg car traveling at 15 m/s south collides with a 4500 kg truck at rest. The car and truck stick together and move together after the collision. What is the final velocity of the 2 vehicles.

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A boy with a mass of 47.4 kg jumps with a horizontal speed of 4.2 m/s onto a stationary skateboard. The student and skateboard move with a speed of 3.95 m/s. (a) What is the mass of the skateboard? (b) How fast would the student have to jump to have a final speed of 5 m/s?