Answer on Question #72866 Physics / Other

A $m = 40$ g bullet with a velocity of $u = 500$ m/s hits a $M = 3$ kg wooden block at rest. After impact, the bullet lodges in the wooden block. Find the velocity v of the bullet and block after impact.

Solution:

The law of conservation of momentum gives

$$mu + M0 = (m + M)v$$

Thus

$$v = \frac{mu}{m + M}$$

$$v = \frac{0.04 \times 500}{0.04 + 3} = 6.6 \text{ m/s}$$

Answer: 6.6 m/s