P#5

Ch 6 - pg 177

$m_1 = 3.00\,g = .003\,kg$
$v_1 = 1.5 \times 10^3\ m/s$

$m_2 = .145\,kg$
$v_2 = ?$

a) $p_1 = p_2$ so $m_1 v_1 = m_2 \cdot v_2$

$(.003\,kg)(1.5 \times 10^3\ m/s) = (.145\,kg) \cdot v_2$

$\boxed{v_2 = 31.0\ m/s}$

b) $m_1 = .003\,kg$
$v_1 = 1.5 \times 10^3\ m/s$

$m_2 = .145\,kg$
$v_2 = 31.0\ m/s$

$KE = \frac{1}{2} \cdot m \cdot v^2$

$KE_{Bullet} = \frac{1}{2} \cdot m_1 \cdot v_1^2$

$= \frac{1}{2}(.003\,kg)(1.5 \times 10^3\ m/s)^2$

$\boxed{KE_{Bullet} = 3380\ J}$

$KE_{Ball} = \frac{1}{2} \cdot m_2 \cdot v_2^2$

$= \frac{1}{2}(.145\,kg)(31.0\ m/s)^2$

$\boxed{KE_{Ball} = 69.8\ J}$

Bullet has greater KE