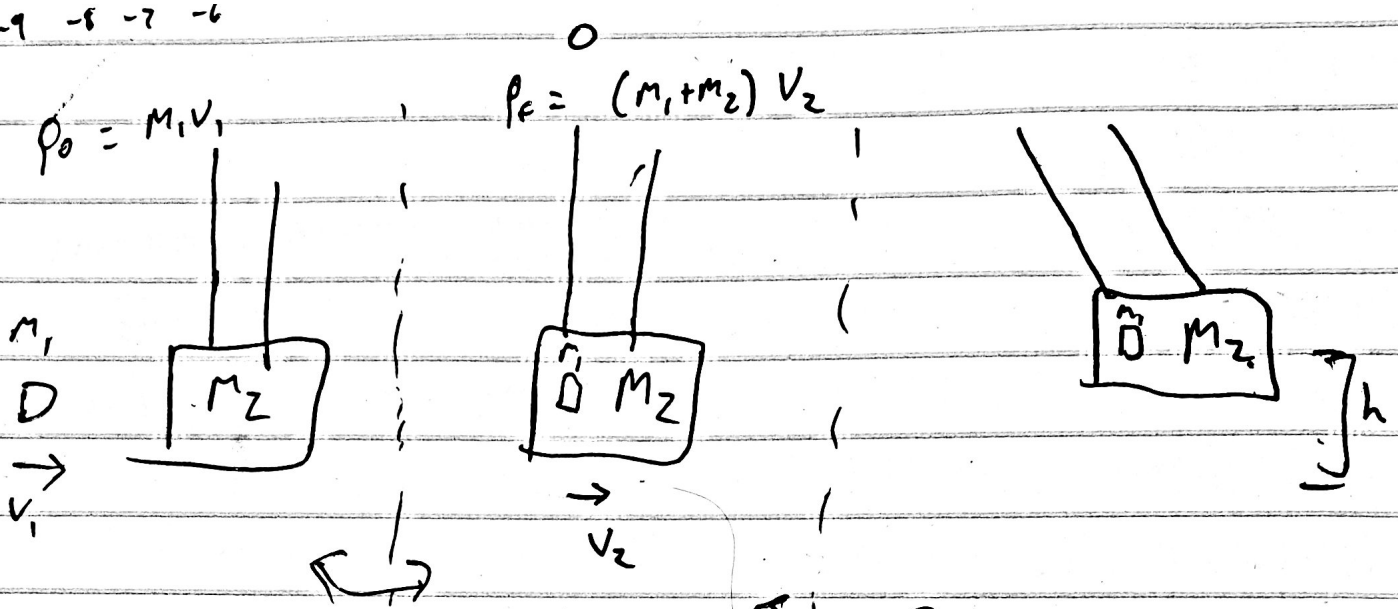
-10 -9 -8 -7 -6



Momentum:

$m_1 v_1 = (m_1 + m_2) v_2$

$\frac{1}{2}(\cancel{m_1+m_2}) v_2^2 = (\cancel{m_1+m_2}) gh$

$\frac{1}{2} v_2^2 = gh$

$v_2 = \sqrt{2gh}$

$= 1.71 \frac{m}{s}$

Energy

$g = 9.8 \frac{m}{s^2}$

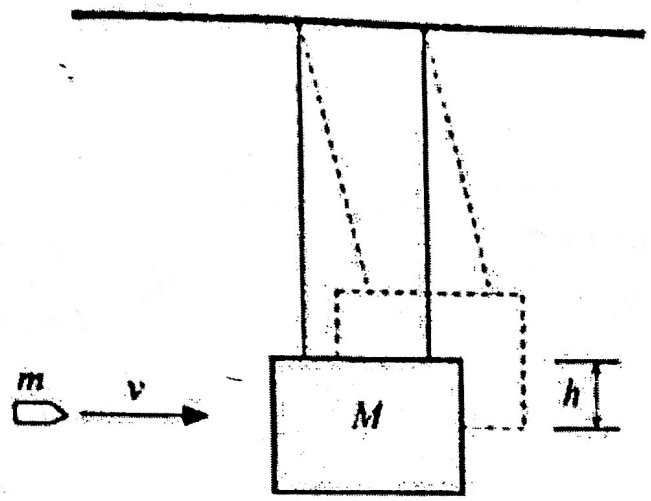
$\frac{1}{2}(m_1+m_2) v_2^2 = (m_1+m_2) gh$

$m_1 v_1 = (m_1+m_2) v_2$

$v_1 = \frac{(m_1+m_2) v_2}{m_1} = \frac{(0.02+1.5)(1.71)}{(0.02)}$

$\approx 130 \frac{m}{s}$

A 20.0 g pellet is fired into a 1.50 kg block hanging by a vertical cord from the ceiling.



0.15m

After the collision, the center of mass of the system rises 15.0 cm from its initial position.

The initial velocity of the pellet is

first find velocity of bullet & block system

$\frac{1}{2}(M_1+M_2)V_2^2 = (M_1+M_2)gh$

$\frac{1}{2}V_2^2 = gh$

$V_2 = \sqrt{2gh}$

$\approx$