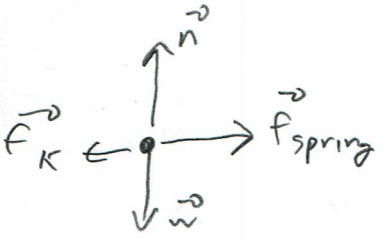
A:

B:

FBD



$\vec{n}$ and $\vec{w}$ are perpendicular to the motion and do no work.

$\vec{f}_{spring}$ is conservative: we'll use conservation of energy

$\vec{f}_K$ is constant and opposite motion, so $W_{fK} = -f_K d$

(and $W_{other} = W_{fK} = -f_K d$)

$$E_B = E_A + W_{other}$$

$$K_B + \cancel{U_B}^{\,0} = \cancel{K_A}^{\,0} + U_A - f_K d$$

U_B: spring at relaxed length

K_A: starting from rest

$$\frac{1}{2} m v_B^2 = \frac{1}{2} k x_A^2 - f_K d$$

$$\Rightarrow v_B = \sqrt{\frac{k}{m} x_A^2 - \frac{2 f_K d}{m}} = 1.265 \text{ m/s}$$

this is a very slow speed! But then again it is a toy gun.