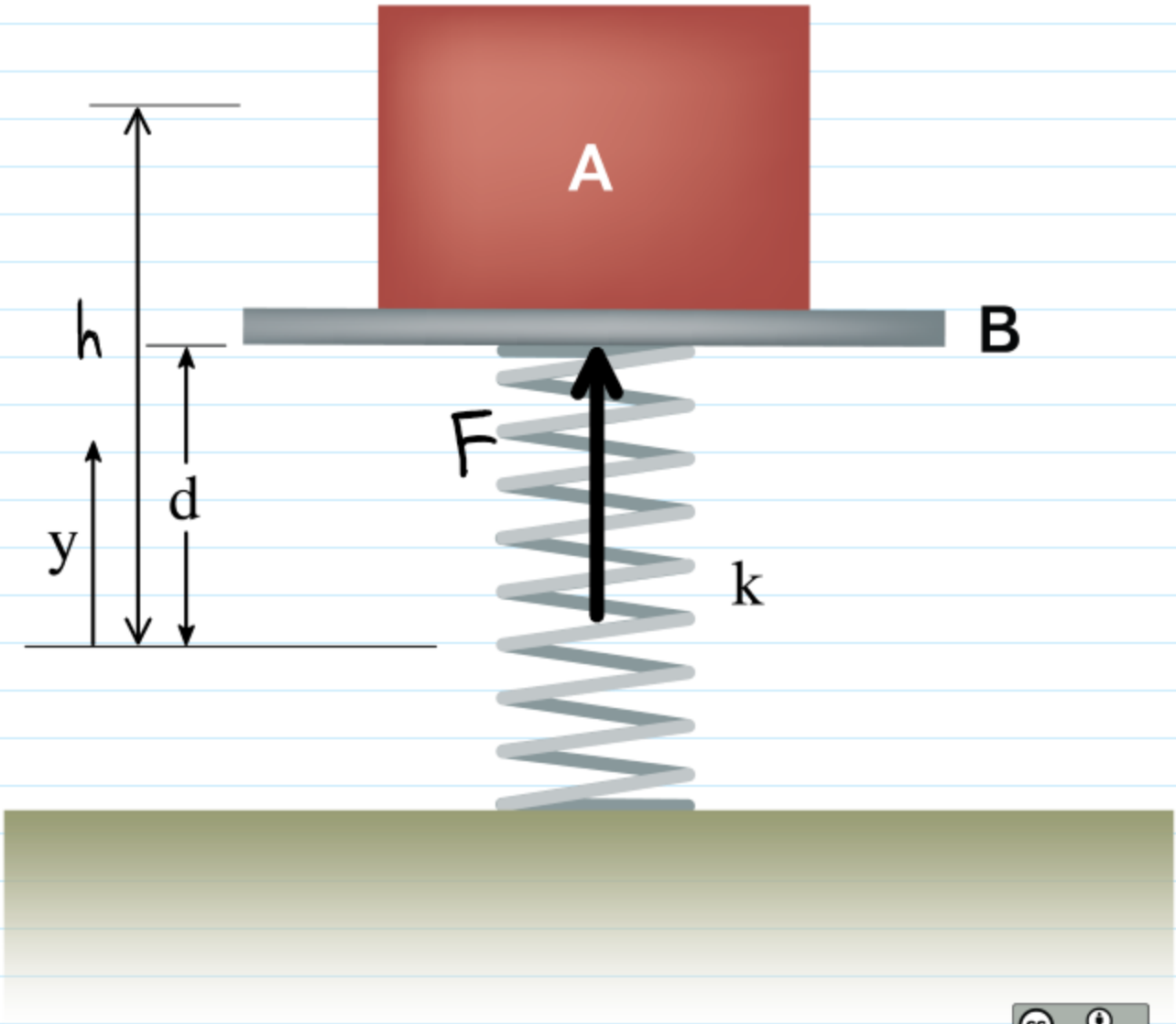
21-P-WE-GD-004



The box A rests on platform B, which is attached to a spring with $K = \underline{K}$ N/m. The spring is initially stretched $\underline{d}$ m, then is stretched even further to $\underline{h}$ m.

If a force F is applied to stretch the spring, and box A has a mass of $\underline{m}$ kg, what is the work done by gravity and the spring?

(Assume $g = 9.81 m/s^2$, neglect the mass of platform B)

given

K, m, d, h

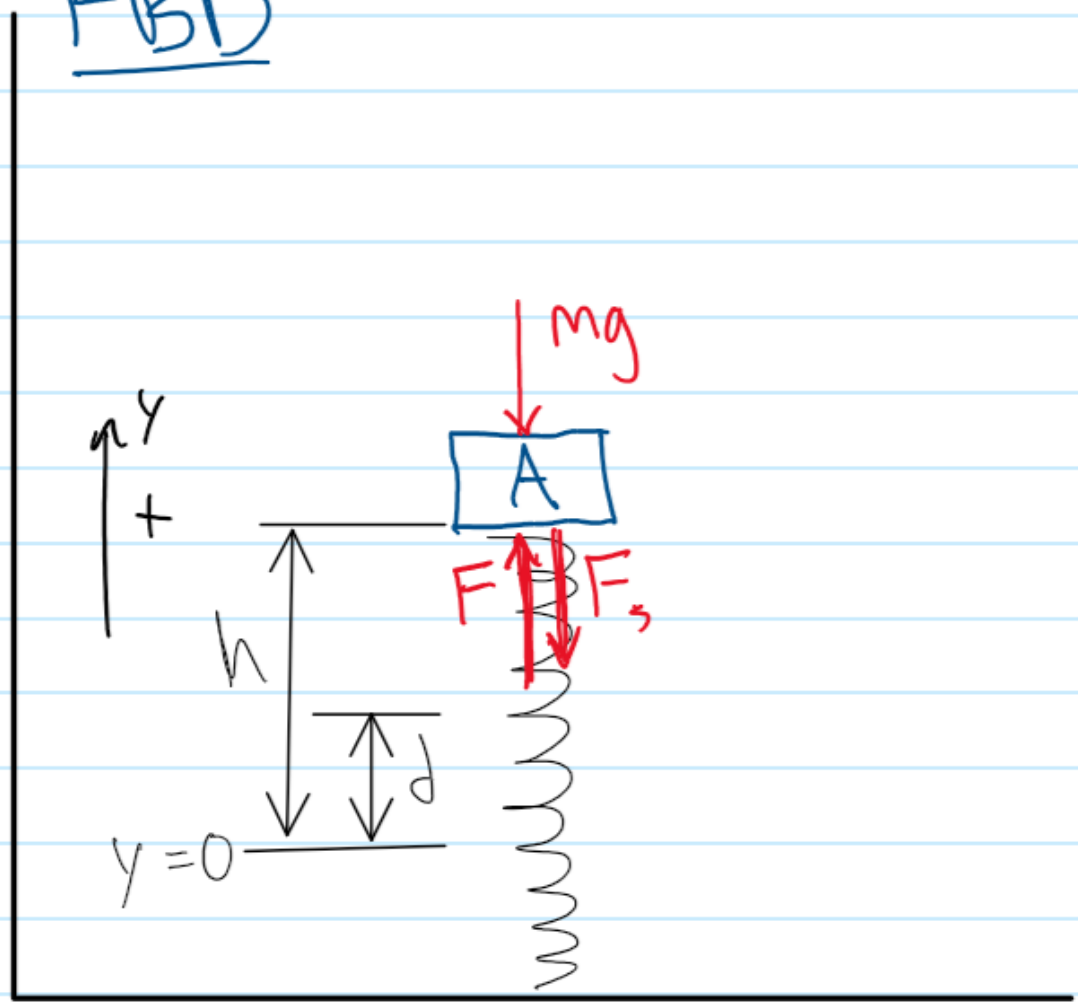
find

W

Force Equilibrium

$\Sigma F_y = ma_y = F - mg - F_s$

FBD



Work

$W_g = -mg(h-d)$

$W_s = -\left[\frac{1}{2}k(h)^2 - \frac{1}{2}k(d)^2\right]$