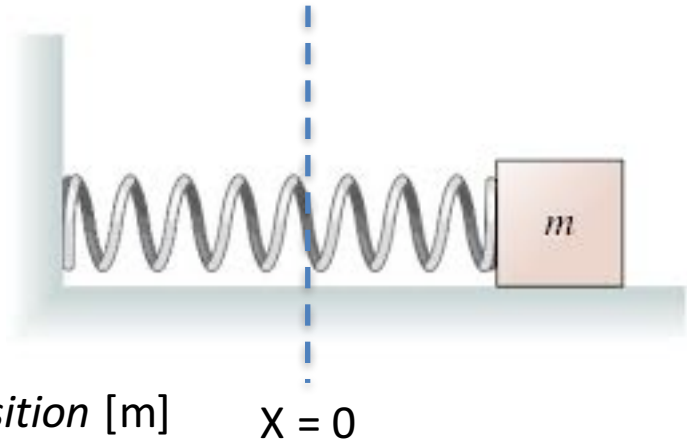# Springs

Simple Harmonic Motion: **Springs**

- When a Hooke's law force acts on an object, that object will oscillate back and forth in SHM.

$$F = -kx$$

F = Springs Force [N]
k = Springs Constant [N/m]
x = distance springs is stretched *from its equilibrium position* [m]

X = 0

Spring (Elastic) Potential Energy: $\quad U_s = \dfrac{1}{2}kx^2$

Period: $\quad T = 2\pi\sqrt{\dfrac{m}{k}}$

Ex: A 0.75 kg mass is added to a spring of unstretched length 0.2 m. This causes the spring to stretch to a length of 0.35 m.

What is the spring constant of the spring?

If the same spring is now turned horizontally and compressed a distance of 0.15 m, how much potential energy is stored in the spring?

If the spring is released from this compressed position, what velocity will a 0.75 kg mass have when it passes through the equilibrium position?