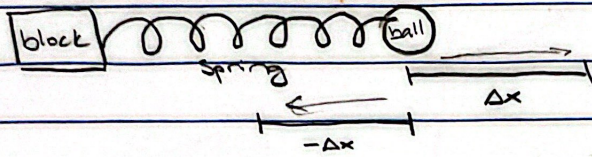


Vibrations & Waves § Simple & Harmonic motion



Spring constant → stiffness of spring → (k)

- Equilibrium Position = location of mass/end of spring at rest
- Restoring Force: force that moves spring back to eq. position

→ $F = -kx$ ←
(Hooke's law)

- Amplitude = maximum height of wave (max. displacement) 1 period
- Period = time from one end of wave to the other (sec)
- Frequency = how many cycles per second ($\text{Hz} = \frac{1}{\text{sec}}$); per.
- Cycle = 1 full back & forth

Ex:

$m = 200 \text{ kg}$ 2 sig. fig $F = -kx$
 $\Delta x = 3.0 \text{ cm}$ $k = \left(\frac{F}{x}\right) = \frac{-m \cdot a}{x} = \frac{-200 \cdot -9.81 \text{ m/s}^2}{0.030 \text{ m}} = \frac{1962 \text{ m/s}^2}{0.030 \text{ m}} = 65400 \text{ s}^{-2}$
 goal = k ↳ $\boxed{6.5 \cdot 10^4 \text{ kg/s}^2} = k$