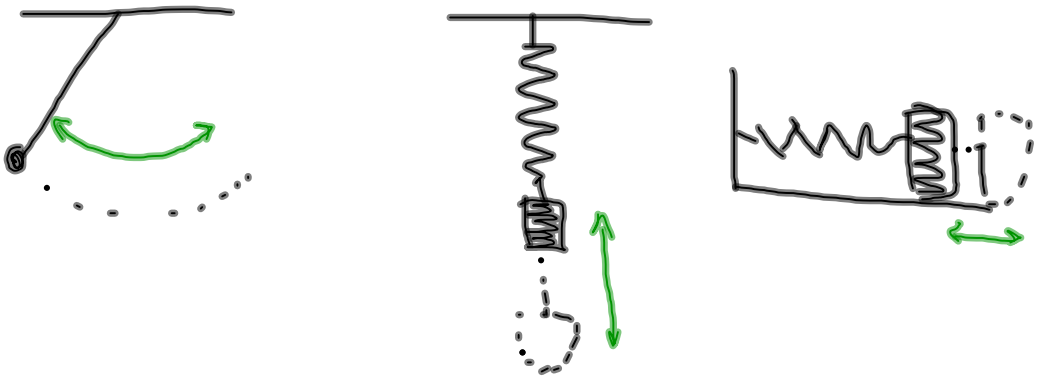
GET YOUR CLICKER
& A STOPWATCH

LECTURE: BOUNCY THINGS
(CHAPTER 13)



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VOCAB

PERIOD (T): TIME FOR ONE CYCLE, BOUNCE, SWING
UNITS: s

FREQUENCY (f): MEASURE OF HOW QUICKLY SOMETHING "BOUNCES"
UNITS: Hz (HERTZ = $1/s$, s^{-1})

$$f = \frac{1}{T}$$

IF $T = 0.97s$, WHAT IS f? (1.03 Hz)

HOW MANY BOUNCES IN 1 MIN?

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SPRINGS

LESS MASS → HIGHER f
LOWER T

$$T = 2\pi\sqrt{\frac{m}{k}}$$ ← SPRING CONSTANT

$$= 2\pi\sqrt{\frac{0.9\,kg}{30\,N/m}} \approx 1.09\,s \quad (\text{OUR MEASURE} = 0.97\,s)$$

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GIVEN: $k = 75\,N/m$
$T = 0.5\,s$

FIND: $m = ?$

$$T = 2\pi\sqrt{\frac{m}{k}}$$

$$\frac{T}{2\pi} = \sqrt{\frac{m}{k}}$$

$$m = k\left(\frac{T^2}{4\pi^2}\right)$$

$$m = \frac{kT^2}{4\pi^2}$$

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PENDULUMS

T NOT AFFECTED BY MASS

LENGTH? ✓

$$T = 2\pi\sqrt{\frac{L}{g}}$$

A LONG
B SHORT

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