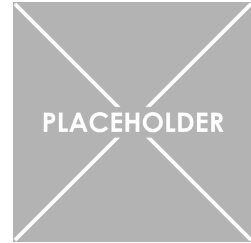# Mass on a spring

Key words: Harmonic oscillator, Spring, Simple Harmonic Motion

Equipment List:
1. Retort stand with 3 connectors, a bar, and 2 clamps
2. Box of springs with various spring constants
3. Box of masses with adaptor hook

How to assemble and operate:
- Use one connector to fix the bar horizontally near the top of the stand
- Connect 2 clamps to this bar with the other connectors
- Hang 2 similar springs (so the spring constants are the same) from the clamps
- Hang different masses from the springs
- Stretch the springs a bit (not too much or the masses will fly off)
- Observe the different oscillation frequencies
- To demonstrate the effect of the spring constant on the oscillation frequency, repeat the experiment with different springs holding similar masses.
- To demonstrate that the frequency of oscillation does not depend on the initial stretch of the spring, hang similar masses from similar springs and stretch the springs

Description/Theory:

This demonstration illustrates a harmonic oscillator through masses on springs. The natural

frequency of such an oscillator is given by $\omega = \sqrt{\frac{k}{m}}$ where m is the mass hanging from the

spring, and k is the spring constant.

Comments/Notes:

Ensure that the retort stand is on a stable surface.

The mass holder also has a mass of 5g. Keep this in mind when comparing frequencies.