**Purpose:** To find the spring force constant for the white spring.

**Data:** 0g = equilibrium at 30 cm

100g added = 30.1 cm

150g added = 30.5 cm

250g added = 32.5 cm

300g added = 34 cm

500g added = 39 cm

Force = mass(kg)\* Gravity(m/s^s)

**Finding K:** Slope = Force/Displacement = k(spring constant) = 42.226 N/m

|  |  |  |
| --- | --- | --- |
| Mass added (grams) | Force (Newtons) | Displacement (meters) |
| 100 | 0.981 | 0.001 |
| 150 | 1.4715 | 0.005 |
| 250 | 2.4525 | 0.025 |
| 300 | 2.943 | 0.04 |
| 500 | 4.905 | 0.09 |
|  |  |  |
|  |  |  |
| K value = Slope = 42.226 N/M |  |

**Derivation for Potential energy**

F=dU/dy=-ky

∫dU/dy=∫-kydy

U=1/2ky^2