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AP Physics C

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Lab Write-Up: : Springs and Potential Energy

**Title**: Springs and Potential Energy

**Purpose**: The purpose of this lab was to calculate the relationship between spring compression, kinetic energy, and potential energy.

**Equipment**:

* Projectile launcher
* Two marbles
* Measuring tape
* Gold pipe cleaner

**Procedure**:

1. Set up the projectile launcher
2. Extend the measuring tape from the base of the launcher parallel to the horizontal motion
3. Insert marble into the projectile launcher
4. Fire marble from each of the five spring comressions
5. Use the gold pipe cleaner to mark the point where the marble hits the ground and record the distance traveled.

**Data**:

|  |  |  |  |
| --- | --- | --- | --- |
|  | | | |
| x (m) | PE (J) | Range (m) | V (m/s) |
| 0.047 | 0.0354 | 0.75 | 3.3 |
| 0.063 | 0.0832 | 1.15 | 5.06 |
| 0.079 | 0.157 | 1.58 | 6.96 |
| 0.095 | 0.28 | 2.11 | 9.29 |
| 0.111 | 0.313 | 2.23 | 9.81 |
| 0.047 | 0.051 | 0.92 | 4.05 |
| 0.063 | 0.072 | 1.09 | 4.79 |
| 0.079 | 0.087 | 1.2 | 5.28 |
| 0.095 | 0.154 | 1.59 | 7 |
| 0.111 | 0.22 | 1.9 | 8.36 |

**Conclusion**:

From this experiment, it is evident that potential energy in a spring is dependent on the compression of the spring. The potential energy, written as a function of distance compressed, for this particular spring is y = 22.545x2 + 0.1004x - 0.0149. Errors in this lab include the fact that no fiction or air resistance was taken into account, multiple launchers were used, and that distance traveled was determined by observation.