Projectile Motion Lab

AP Physics 1

**Objective**: Students will use their new understanding of projectile motion to track the motion of an object in two dimensions

**Your mission:** Your lab groups will devise methods to attain data involving the velocity (Vfy&Vfx) and horizontal displacement (dx) of an object in two dimensions. You will compare this data to calculated values and calculate the average and the standard deviation of your experimental values.

1. Using the materials provided to you, you will devise a procedure to impart an initial X direction velocity on an object. Your procedure should result in the same X velocity every time.
2. Now, using those materials, roll the ball off of the table.
3. Determine which of the “big five” motion variables you can measure in your procedure
4. Determine a way to use your measured values to mathematically derive the remaining “big five” variables in both X and Y
5. Follow your derived procedure to identify the required variables (Vi, Vf, a, Δd, t) in both X and Y and record five trials. ***Revise your rolling method to generate a new Vix and record five additional trials. You should end up with ten trials total.***

**Materials available to lab groups:**

* Motion detectors and computers
* Wood scraps
* Meter sticks
* Stop watches (you may use your phones)
* Marbles (or other small rolling objects)
* Masking tape
* 6 paperclips

You need not use all of these. Confirm your procedures with me if any questions arise.

**Your Lab Report Should Include:**

* **Objective**
* **Procedures & Materials**
* **Data🡪 Including Standard Deviation** (to be discussed in a later class)
* **Conclusions**