Projectile Lab – Part A: Finding the v_x of YOUR launcher

1. **Record the # of YOUR launcher first!** They are all different and you will need to use the same one for Part B next week.
2. Take careful note by observing the model up front for how you will shoot, **being certain to regularly check with a level that it always launches at 0° (perfectly horizontal!).**
3. Using ONLY the **"SHORT RANGE" setting,** fire 3 times to determine where you will **tape your d_x mark paper down *IN PORTRAIT POSITION* so that the ball will approximately hit the middle of the paper.**
4. Once it's taped down, ***LAY* a piece of carbon paper on top of the mark paper with the *side that has WORDS on it UP*.**
5. Perform 5 firing trials and **measure from the floor directly under your launcher's opening to the middle dot of the 5 that were made on your mark paper for your d_x.** ***THEN ALL MEMBERS OF YOUR GROUP MUST SEPARATELY CALCULATE YOUR LAUNCHER'S v_x OUT TO THE HUNDREDTHS PLACE AND COMPARE!***
6. **TIPS**: *Have the same person perform the launches with a quick, straight upward pull; again, also check often with the level to make sure the launcher is firing at 0°!*

Students will apply the kinematic equations to simple projectile motion situations ($v_{iy} = 0$) to calculate an object's initial horizontal velocity, vertical displacement or horizontal displacement.

Projectile Lab – Part B: Predicting the d_x from a new height

1. Using the same launcher you used in part A and the v_x you calculated it to have, take note that Mr. S has now moved your launcher to a new height (a new d_y).
2. Carefully measure the new d_y you will now fire from and then use it with your launcher's v_x to calculate the exact d_x your launcher should fire the ball. (ALL DO THIS!)
3. Armed now with your predicted d_x, get 2 sheets to ↓.....
4. Then position/tape your target paper in its proper place with carbon paper laid on top; your grade comes after 5 shots are taken and one of these results for your BEST 2 dots:

Not on paper = 14/20
Outside 10% but on paper = 16/20;
Inside 10% = 17/20; Inside 5% = 19/20;
Actually hits d_x line! = 20/20
AND +2 BP for all on the team!