

PHYSICS 190: MECHANICS and HEAT; Lab 3: Projectile Motion

1. Determining launch speed

a. set up

1. materials needed: projectile launcher, meter sticks, paper and masking tape
2. place launcher on a table (table should have a horizontal top)

b. cautions:

1. care must be taken when cocking the launcher (the firing pin has a groove in it whose edges can be razor sharp!)
2. never fire the launcher when someone could be hit by the projectile
3. do not leave the projectile on the firing pin when not in the process of firing the launcher (they have been known to fire spontaneously)
4. place the paper on the floor (test fire once to determine where the paper should be placed)

c. procedure:

1. measure distance from bottom of the projectile when in launch position to the floor
2. fire the launcher 5 or 6 times to determine average horizontal distance from the projectile's center to the center of the hit pattern on the paper)
3. use the kinematic equations to determine the launch speed of the projectile (it is usually between 5 and 7 m/s)

2. Shooting a basket

a. set up

1. materials needed: projectile launcher, meter sticks, a wooden block and ring stand
2. place the block under the front end of the launcher and position the launcher so that the handle hangs over the back edge of the table

b. Procedure:

1. measure distance from bottom of the projectile when in launch position to the floor
2. determine inclination angle using trigonometry not a protractor
3. use the kinematic equations to determine the horizontal position of the ring stand if the projectile is to pass through the ring (the ring is to be 40 cm above the floor)

c. test prediction:

1. fire projectile in the presence of the instructor (**do not fire the projectile before the instructor is present**)

3. Lab Report should contain:

- a. a data table for part one and one for part two which include all of your measurements
- b. the calculations for both parts