**Horizontally Launched Projectile Lab  
Bull’s Eye**

**Your Goal:** To determine the horizontal distance of a horizontally launched projectile as well as investigating the factors that are consistent in both dimensions during the flight of a projectile.

**Equipment:** Stand, Ramp, photo-gate timer, meter stick, ball

**Procedure:**

1. Determine the final velocity of your projectile when it reaches the bottom of the ramp. Use the photo gate to accomplish this task for distances down the ramp beginning at 20 cm and going up every 20 cm. Record the time in the table below.

**The width of the ball is 0.019 m.**

Data table:

|  |  |  |  |
| --- | --- | --- | --- |
| **Distance rolled down ramp (m)** | **Time in photo-gate**  **(s)** | **Final velocity =**  **width of ball ÷ time** | **Final Velocity**  **(m/s)**  **As it launches horizontally off of the ramp** |
| **.20** |  |  |  |
| **.40** |  |  |  |
| **.60** |  |  |  |
| **.80** |  |  |  |

1. When you have solved for all of the final velocities, bring your projectile lab and ball to Mrs. Mikula for her to check your answers and give you further directions.
2. You will drop your ball from \_\_\_\_\_\_\_\_\_\_\_\_ m to give it an initial horizontal velocity of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. (the final velocity that you calculated above becomes the initial velocity of the projectile)
3. Calculate the time the ball is in the air:  
   Formula:

Plug in numbers:

Answer:

1. Calculate the horizontal distance the ball will fall away from the edge of the table:  
   Formula:

Plug in numbers:

Answer:

1. Once you think you know where the ball will land, place the target on the ground at the calculated distance so that your projectile, when dropped from your given distance up the ramp, will land on your target.   
   YOU GET ONE OPPORTUNITY TO HIT THE TARGET.