

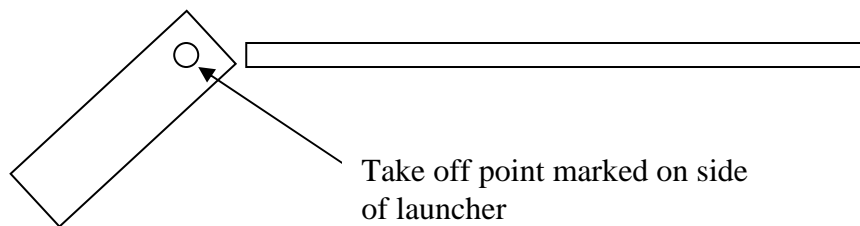
Practical 3 Distance travelled by a projectile

Introduction

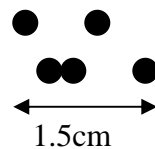
In this practical a “launcher” will be used to shoot a ball across the table. The balls landing point will be recorded using “carbon paper” so that its horizontal displacement can be measured.

Procedure

Clamp the launcher onto the edge of the table so that the take off point is level with the table top as shown on the diagram.



Push a ball into the launcher and shoot it across the table by pulling the release mechanism. To mark the balls landing point place a piece of paper in the landing area, on top of this place a sheet of carbon paper, now shoot the ball again. Repeating the same procedure several times will enable you to estimate the uncertainty in your measurement, see diagram below



Spread of dots is approximately 0.75cm so uncertainty is $\pm 0.75\text{cm}$

- Estimate the uncertainty in measuring the displacement.

The aim of this experiment is to investigate the relationship between the angle of take off and the horizontal distance travelled. Set the angle of the launcher and measure the angle using the protractor mounted on the side. The uncertainty of this measurement is due to the difficulty in reading the scale.

- Estimate the uncertainty in measuring the angle

Launch the ball several times and measure the average displacement.

Make a copy of the table below and fill in your results. Change the angle and repeat the process for at least 5 different angles. Also fill in the uncertainties in the first row of the table.

Angle $^{\circ}$	Displacement cm
\pm	\pm

Analysis

Using Graphical Analysis, draw a graph of Displacement (y axis) against Angle (x axis). Plot a curve that passes through the points and display the equation of the line.

- From the graph find the angle that gives the furthest range.
- Where the results as expected?
- Is there any way the experiment could be improved?

Photo of apparatus

