

PROJECTILE MOTION

For lab this week we will study two-dimensional motion under the influence of gravity by looking at the motion of a projectile.

The apparatus in lab can project a metal ball of about 2 cm diameter. This can be set on a table to project the ball horizontally or at an angle. We will do both.

A. Measuring the speed of a projectile:

- 1) With the "projector" horizontal consider what measurements you think you should make in order to determine the speed with which the ball leaves the "projector". Be prepared to discuss these.
- 2) Make what measurements you decide are necessary. Take multiple measurements, as appropriate, to be able to estimate the uncertainty.
- 3) Calculate the speed taking into consideration the uncertainty of your measurements.

B. Prediction of a landing location:

- 1) Using your value of speed obtained above, predict where the projectile will land when the apparatus is at an angle. Although not exact, you can assume a percent uncertainty in your horizontal position calculation of three times the percent uncertainty you determined in (A) for the initial speed.
- 2) Check out your prediction by firing the projectile and seeing if it lands at your predicted position within the uncertainty.

