Open-Ended Lab
Projectile Motion

Objective

Using the background information on projectile motion that you learned in class, you are going to design and conduct a projectile motion experiment.

Equipment

- Projectile launcher and plastic ball
- Measuring tape
- Stopwatch

Task

Your experiment should be designed to investigate:
- The initial velocity or muzzle velocity
- The range for horizontal projection
- The range for projectiles launched at an angle

Lab Report

Your lab report should include the following sections:

Purpose

This is a statement of the problem to be investigated. It provides the overall direction for laboratory investigation and *must* be addressed in the conclusion.

Equipment

- A list of all laboratory equipment used in the investigation
- A *detailed* and *labeled* diagram to illustrate the setup of the experiment

Procedure

- Step-by-step procedure carefully explained in a numbered sequence
- All experimental variables identified and named
- Brief description of how the independent variables are controlled

Hint: Your audience is not necessarily composed of physics students. Someone who was not present during the lab should be able to understand how the experiment was performed and be able to reproduce the results by reading your procedure.

Data

- What data needs to be taken? How many trials do you have to include?
- How is data reported? Data tables are a good idea! The units for physical measurements in a data table should be specified in the column heading only.

Data Analysis

- How do you interpret data?
- Include all graphs, analysis of graphs, laboratory calculations, and percent errors.

Conclusions

- Discuss any questionable data or surprising results.
- Explain the possible source of any error or questionable results.
- Suggest changes in experimental design that might test your explanations.