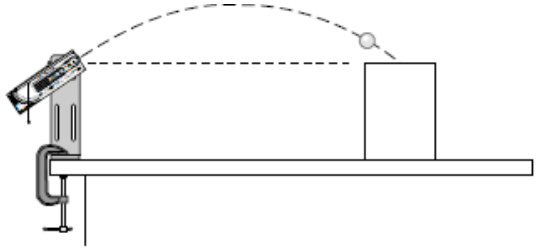
LAB PRACTICUM: PROJECTILE MOTION
LAB STATIONS

INVESTIGATION A

TASK:
To determine the landing place of the ball when shot at an angle. Ball lands at the same level as the shot ball.



1. DATA COLLECTION

- Identify the variables that you can measure and describe the procedure to measure those variables.
- Write down your data with appropriate units. Include multiple trials and obtain the average.

2. DERIVATION

- Derive an equation that will allow you to predict where the ball will land when shot at an angle.
- Use the equation obtained to predict where the ball will land at 20^{o}, 30^{o}, 40^{o}, 50^{o} and 60^{o}
- Show ONE sample calculation with data, equation, substitution, answer.

3. TESTING

- Find the experimental ranges for the different angles and record your results.
- Calculate the percent difference.

4. CONCLUSION

- If your results differ from what is expected, provide a plausible explanation.
- List the sources of experimental uncertainty.

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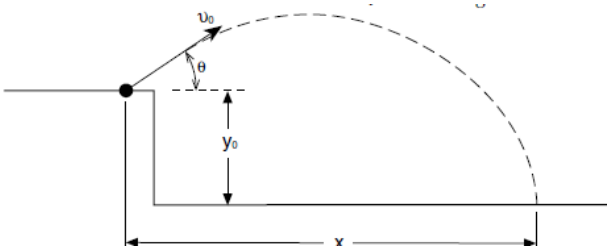
INVESTIGATION B

TASK:
To determine the landing place of the ball when shot at an angle. Ball lands on the floor.



1. DATA COLLECTION

- Identify the variables that you can measure and describe the procedure to measure those variables.
- Write down your data with appropriate units. Include multiple trials and obtain the average.

2. DERIVATION

- Derive an equation that will allow you to predict where the ball will land when shot at an angle.
- Use the equation obtained to predict where the ball will land at 20^o, 30^o, 40^o, 50^o and 60^o
- Show ONE sample calculation with data, equation, substitution, answer.

3. TESTING

- Find the experimental ranges for the different angles and record your results.
- Calculate the percent difference.

4. CONCLUSION

- If your results differ from what is expected, provide a plausible explanation.
- List the sources of experimental uncertainty.

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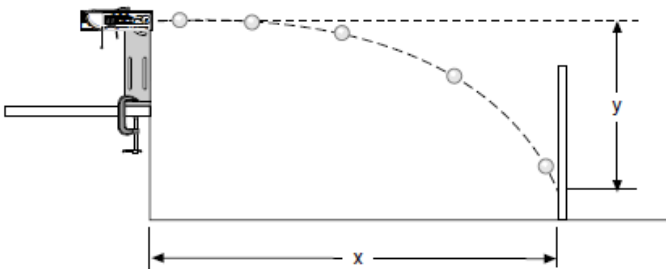
INVESTIGATION C

TASK:
To determine how the vertical distance the ball drops is related to the horizontal distance the ball travels when the ball is launched horizontally from a table.



1. DATA COLLECTION

- Identify the variables that you can measure and describe the procedure to measure those variables.
- Take multiple measures by moving the target about 10 to 20 cm closer to the launcher.

2. ANALYSIS

- Plot ***y*** vs ***x***
- Describe the relationship between the variables.
- What is the meaning of the y-intercept?
- What variable do you need to modify in order to obtain a linear relationship?
- Calculate the slope of the line with appropriate units
- Derive an equation that will represent the slope of the line

3. CALCULATION

- Using the slope of the line, determine the muzzle velocity.
- How does it compare with the muzzle velocity found with the photogate?

4. CONCLUSION

- If your results differ from what is expected, provide a plausible explanation.
- List the sources of experimental uncertainty.

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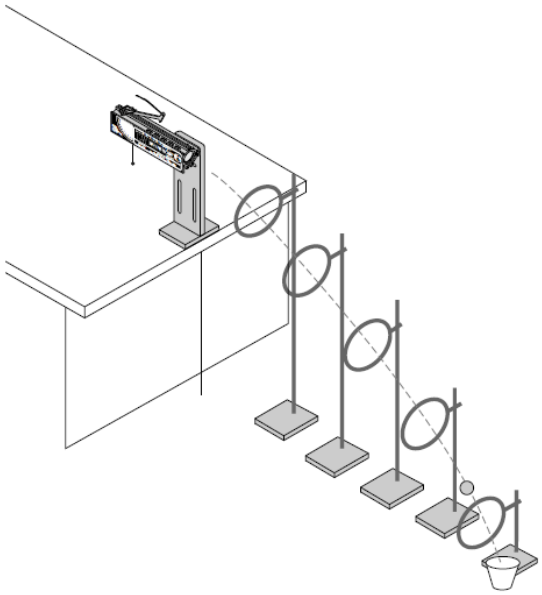
INVESTIGATION D

TASK 1:

To determine the location of the hoops so that the ball lands in the cup



TASK 2:

The projectile is set on the floor and it will be shot at an angle

FOR EACH TASK:

1. DATA COLLECTION

- Identify the variables that you can measure and describe the procedure to measure those variables.

2. PREDICTION

- Calculate the position of each of the rings and the cup.
- Show one full calculation for each coordinate (*x, y)*

3. TESTING

- Place the rings on the floor and perform your experiment.

4. CONCLUSION

- Did the ball enter the cup?
- List the sources of experimental uncertainty.