

Names:

Student numbers:

Projectile Motion

Introduction:

Imagine you are a captain of a pirate ship and are about to fire your cannons at the enemy, but the cannon balls completely miss your target! Thankfully you are a smart captain and know about the **laws of physics!**

With your understanding of projectile motion, you can successfully aim the cannon so that the cannon ball will hit the target.

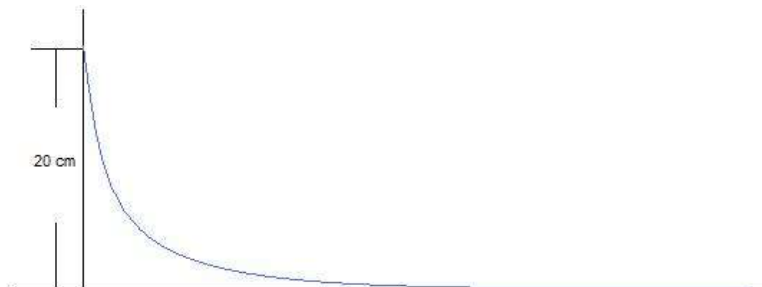
In this experiment you will use your basic understanding of projectile motion to successfully hit a target!

Equipment:

- Projectile motion kit
- Basket
- BeeV velocity measuring device

Procedure:

1. Setup the projectile motion kit as seen below:



2. Align the setup with the edge of the table.
3. Select the smallest metal ball from the kit.
4. Now release the ball and let it fall to the floor. What path does the ball take?
Please draw this below.

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5. Place the device on top of the projectile motion kit, at the end of the table. Measure the speed of the ball by using the BeeV device. Take three speed measurements. Please take the mean value of these measurements.

6. With the velocity measured. Please measure the height at which the ball is launched off of the table.

7. Now using the Equations from your formula sheet please solve for where the ball will hit the floor.

8. Once this is done place your basket at the point where the ball lands and see if you can catch the ball!

Conclusion:

In full sentences, please answer the following questions:

1. Were you able to land the ball in the box? If you could not land the ball in the box, how come?

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Bonus Activities:

Jumping Through hoops

1. Draw the motion of the ball.
2. Select a point along the drawing to place a hoop.
3. See if your ball will go through the hoop.
4. See how many hoops you can use!

Different balls different distances?

1. Try out some of the other ball sizes and materials.
2. Does the velocity change?
3. See if you can repeat the experiment with these new balls!

New Heights!

1. Try changing the height on your launching device to find out what happens to the distance your ball travels.
See if you can land the ball on another table.

Target Practice!

1. Only being able to adjust the height and the ability to push the ball try and hit a target on the ground.