Using **Google Chrome or Firefox**, go to the PhET website <u>http://phet.colorado.edu/en/simulation/projectile-motion</u>. Using the PhET website, explore projectile motion and answer these questions:

Type up your answers and change the title of the file to include your LAST NAME.

1. How do you get a projectile to travel the farthest? (Use the PhET simulation.)

Can you find multiple launch angles that will land on the same spot? What is true about those angles if they exist? (use the PhET simulation and look at the horizontal line the extends from the cannon to compare how far they travelled.) Use the tape measure to find the range (horizontal distance).



THIS IS AN EXAMPLE OF NOT LANDING AT THE SAME SPOT. Look at the horizontal line.

- 3. What happens when you launch a projectile at the same angle but change the initial velocity? (Use the PhET simulation.)
- 4. What happens when you launch a projectile at the same velocity but change the initial angle? (Use the PhET simulation.)
- 5. What launch angles have the longest time in flight? Shortest? (Use the PhET simulation.)

Part Duex:

- **Find the acceleration due to gravity for an angry bird.** Also in your group each person is to find the answer for a different type of bird (red, yellow, blue, and black bird).
- 6. What is the acceleration due to gravity (g) in the Angry Birds world? (Use the movies posted on tigerphysics.org and LoggerPro. Use the help document posted on my website. What measurements would you have to make?) (Assume that the sling shot is 5 meters tall.)

- 7. Is the acceleration due to gravity the same on different levels or does it change from level to level? How does your answer compare to other groups? Site multiple specific examples. e.g. Livia found g on Danger Above 7-1 to be 15 m/s².
- 8. Do different birds have different accelerations due to gravity or is g the same for every bird on a particular level?