Projectile Motion – Physics Phun   Name:_____ #:____
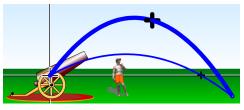
Using **Google Chrome or Firefox**, go to tigerphysics.org → Unit 6 → Angry Birds or use the PhET website http://phet.colorado.edu/en/simulation/projectile-motion. Using the PhET website, explore projectile motion and answer these questions:

<u>Type up your answers up on HOPE.</u>

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

2. 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. Do different birds have different accelerations due to gravity or is g the same for every bird on a particular level? Site multiple specific examples. e.g. Livia found g for the Yellow Bird to be 15 m/s^2.

8. What was your bird's velocity in the X-direction when it left the slingshot? What was your bird's velocity right before it hit the target? What does this tell you about the motion of the bird in the X-Direction?

9. What was your bird's velocity in the Y-direction when it left the slingshot? What was your bird's velocity right before it hit the target? What does this tell you about the motion of the bird in the Y-Direction?