**Algebra 2H Names \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Quadratic Function Unit**

**Projectile Parabolas Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Hour \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**[**https://phet.colorado.edu/sims/html/projectile-motion/latest/projectile-motion\_en.html**](https://phet.colorado.edu/sims/html/projectile-motion/latest/projectile-motion_en.html)

1. Play with the cannon, investigate how the different settings work. Adjust the:  1. speed,  2. angle,  3. object being projected,  4. move the target,  5. use the tape measure,  6. use the Time-Range-Height meter.

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1. - Shoot a projectile at any given angle. Record your angle: \_\_\_\_\_   
   - Now, move the target to record where it landed.   
   - Next, keep all variables the same except the angle.    
   - Can you match the exact target location with another angle? What angle is that? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
   - Can you make a conjecture about the two angles? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_   
   - Test your conjecture. What other pairs did you find to work? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. - Choose any parabolic path that you have created and record at least 7 points (vertex and x-intercepts, plus 4 more). What should go in the x-column? What should go in the y-column?
3. On your graphing calculator, enter the data into your L1 and L2 columns, and find the QUADRATIC regression to fit your data. Write down your equation, rounding to the nearest hundredths place, if necessary.

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4. 1. Show your work below find the vertex of your equation.  
   (x = -b/2a , then plug in to find y)   
   Does this vertex match what is in your table?

2. Show your work below as you use the quadratic formula with your equation to find the x-intercepts.   
Does the x-intercepts you found match the x-intercepts from your table?

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