

Name: \_\_\_\_\_

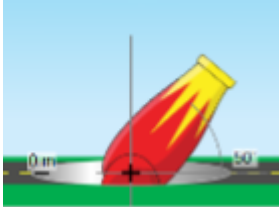
Date: \_\_\_\_\_

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# Projectile Motion PhET Simulation

Go to the Projectile Motion PhET Simulation. The link is on Schoology, or you can go to the website <https://phet.colorado.edu/> and type “Projectile Motion Intro” into the search bar.

- Click “Intro” once it opens.
- Drag the cannon to the ground (altitude of 0 m)



- Make sure to check the two boxes under Velocity Vectors.



1. Fire the cannon. Which method of vector addition is the simulation using (parallelogram or tip-to-tail)?
2. When you fire the cannon, what happens to the  $x$ - and  $y$ - components of the vector over time?
3. Increase and decrease the initial speed. How are the range (that is, how far across the ground) and height (that is how far in the air) affected by changing the initial speed? Why do you think this is?

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4. Now change the angle.

(a) Which angle has the tallest height?

(b) Which angle has the longest range?

(c) Why do you think this is?

5. Find pairs of angles that give the same range. Find as many as you can. See if you can notice a pattern.

6. Explain the reason why your answers to #4 and #5 make sense. Your instructor will help you with this.

