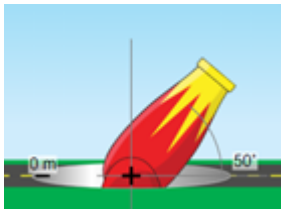
Name: Date: Period:

Projectile Motion PhET Simulation

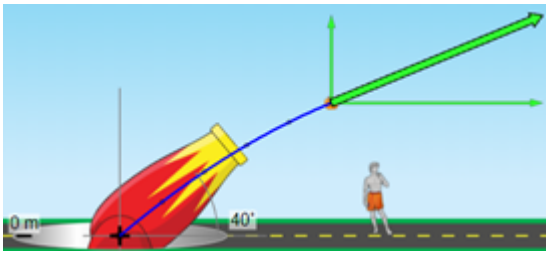
Go to Schoology and click the link to **"Projectile Motion PhET Simulation"**. When the page loads, click the play button.

- Go to the "Intro" tab.
- Drag the cannon to the ground (altitude of 0 m) and make sure to check the two boxes under Velocity Vectors.



1. Describe the shape of the trajectory made by the projectile.

2. Look back at your notes from last time. What is meant by the terms x-component and y-component? Label on the picture below which one is which.

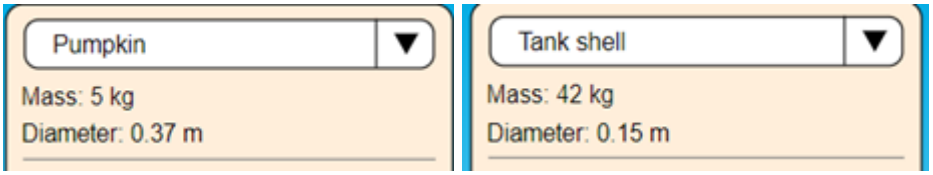


3. When you fire the cannon, what happens to the x- and y- components of the vector over time?

4. How does the combination of x- and y- motion give a curved path?

5. On the simulation, 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?

6. Change from a pumpkin to a tank shell. The mass of the tank shell is much larger.



What happens to the trajectory when you use this larger mass? Why does this make sense?

7. Now change the angle.
   (a) Which angle has the tallest height?

   (b) Which angle has the longest range?

   (c) Why do you think these angles make sense?

8. Can you figure out pairs of angles that give the same range? Why do you think they give the same range? Can you notice a pattern?

_____° and _____°

_____° and _____°

_____° and _____°