Physics
Playing with Projectiles – PhET Simulation

Name:_____ Block:_____

Today you will be playing with a PhET simulation to further explore projectile motion. By the end of the activity, you will understand how mass and initial velocity affect projectiles.

1. Go to: http://phet.colorado.edu/en/simulation/projectile-motion and then click the "Run Now!" button.
2. Change the cannon's angle to 0°.
3. Move the cannon so that it is 20 meters to the left of the target (use the tape measure to help you).
4. Set the cannon's height to 20 meters (use the provided tape measure to help you).
5. From the list of objects, select the football, pumpkin, adult human, piano, or Buick.
6. Record the mass of the projectile.
7. You will test several different speeds. Set the "initial speed" based on the data table and hit the "fire" button.
8. Record the horizontal displacement of the projectile.
9. Make a sketch. Include the cannon and all of the trajectories. Label them by their speed.
10. Click the "erase" button to start the next trial with a clean screen.
11. Repeat steps 5-10 until you have tested all five objects.

Table 1: *Football*   Mass:_____

Speed (m/s):	0	6	12	18	24	30
Horizontal displacement (m)						
Time (s)						
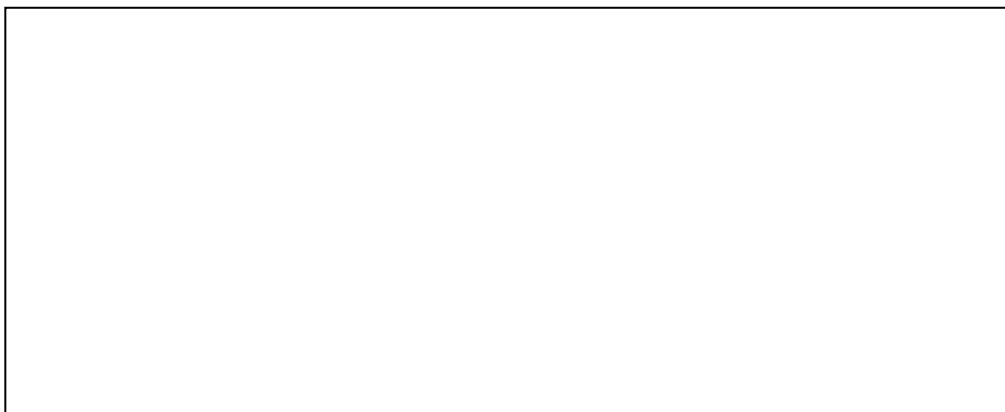
Sketch

Table 2: *Pumpkin*   Mass:_____

Speed (m/s):	0	6	12	18	24	30
Horizontal displacement (m)						
Time (s)						
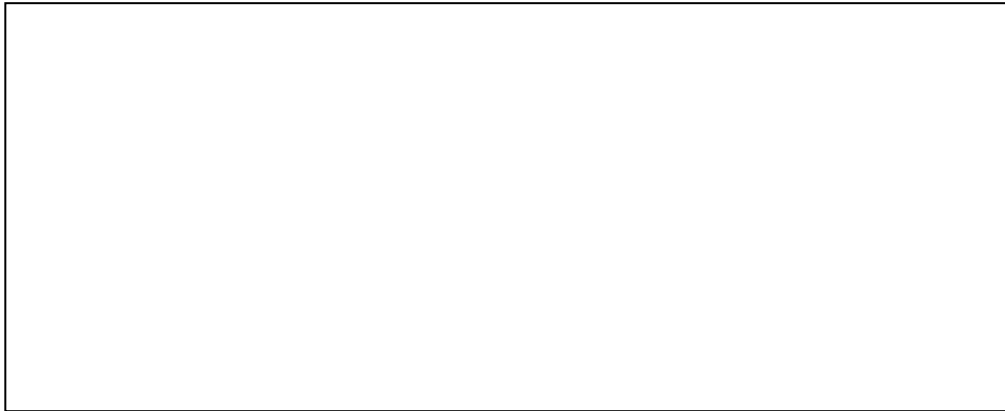
Sketch

Table 3: *Adult Human*   Mass:_____

Speed (m/s):	0	6	12	18	24	30
Horizontal displacement (m)						
Time (s)						

Sketch

Table 4: *Piano*   Mass:_____

Speed (m/s):	0	6	12	18	24	30
Horizontal displacement (m)						
Time (s)						
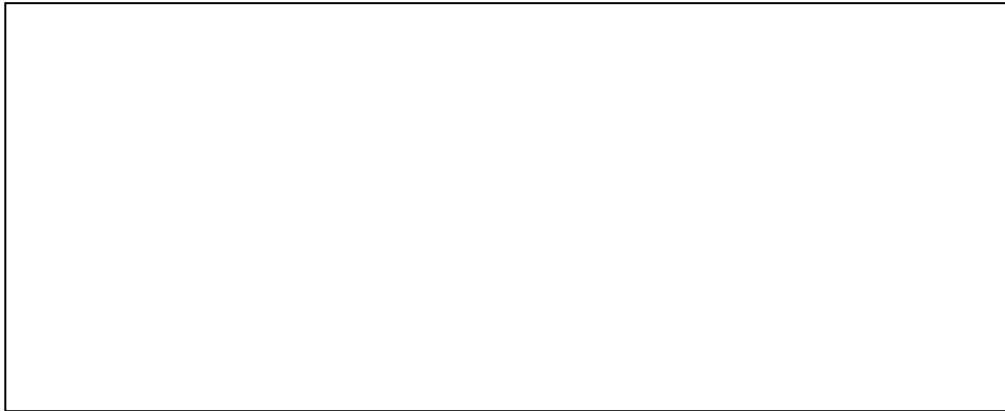
Sketch

Table 5: *Buick*   Mass:_____

Speed (m/s):	0	6	12	18	24	30
Horizontal displacement (m)						
Time (s)						

Sketch

Questions

1. Verify two of your results by using the projectile equations to calculate the time and horizontal displacement of two projectiles.

2. Based on the data you collected, how does the mass of the object affect the horizontal displacement?

3. Based on the data you collected, how does the initial speed of the object affect the horizontal displacement?

4. Write a statement that accurately describes projectile motion based on the activity you completed and the data you collected.