Physics 100 Name: ___________________________________
Newton Sled Activity

Directions: Make a loop of string and test its length to see if it stretches your rubber bands the correct distance. If it does, make 6 more identical loops of string. Save your original to use as a template if you need to make more. Launch all of the items below by burning the string to release the stretched rubber bands. Use the same number of rubber bands every time, and make sure that every launch happens in the same way. The only variable here should be the object that is launched. Fill out the data table as you go. Then answer the questions.

Object Launched	**Sled travel distance (m)**	**Launched Object travel distance (or description of its speed)**
200g mass		
500g mass		
Ping pong ball		
Entire Earth		

1. When the ping pong ball is launched, what gets pushed with the most force, the sled or the ping-pong ball? Explain your reasoning.

2. When the entire Earth is launched, what gets pushed with the most force, the sled or the Earth? Explain how you can tell.

3. Out of all of the items that you launched, which one experienced the most force? ____________________

   Which one experienced the least force? ___________________

   How can you tell?

4. Explain how this activity demonstrates F=ma. Cite specific examples.

5. Newton's 1st Law uses the term "unbalanced." It says that "objects in motion remain in motion, in a straight line and at a constant speed, and objects at rest stay at rest, unless acted upon by an unbalanced (net) force."

    a. Before, during or after an object's launch, when are the forces on the object balanced, and when are they unbalanced?
    b. For each of these times, explain how you can tell.

6. Which of Newton's Laws do you think is most important for understanding what is going on in this activity?

    1st Law: Objects in motion…
    2nd Law: F=ma
    3rd Law: For every action, there is…

    Explain why.