Name _____ block _____ date_____

M&Mium Half Life Lab

Purpose: To model the decay of a typical isotope with respect to half-life

Introduction: The isotope in this simulation is an edible form of M&Mium. There are two natural forms of this "element" **---** "**m**" up form and the "**m**" down form. The "**m**" up form is the stable isotope and is very safe to eat. WARNING: The "**m**" down form is extremely radioactive and can cause excessive growth in the hips and abdomen areas of the body.

Materials:
- Cup of M&M's
- 1 napkin or paper towel

Procedure:
1. With a partner, count the number of M&Mium isotopes in your study and record this number in the data table under *nondecayed isotopes* (radioactive).
2. Place the isotopes in the container and mix. Pour out on a clean surface. Remove the "**m**" up isotopes. Count the remaining candies and record in your data table as the number of undecayed atoms.
3. Return the "**m**" down isotopes (undecayed) to the cup. Mix up and repeat step 2.
4. Continue the process until all isotopes have decayed.
5. You may then eat your candies when both trials are completed.

Data Table:

Trial	Undecayed (Radioactive)
0	
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	

Analysis

Using the graph paper provided, construct a graph by plotting the number of half-lives as the independent variable (x axis) and the number of undecayed atoms as the dependent variable (y-axis). *Remember to label your x-axis, y-axis, and indicate a title for your graph.*

Questions:

1. Define half-life.

2. In your lab experience, you stopped when you reached zero undecayed isotopes. How accurate is this when talking about half-lives?

3. Do you think your graph would have been different if you had started with more pieces of candy, for example 1000 or 500? Explain.

4. Assume that each trial took 30 seconds. Based on your results, what is the half life of M&Mium?

   The value for the half-life is obtained as follows:
   - Select two values on the y-axis. One value should be twice as large as the other (60 & 30 for example).
   - Draw lines from these points to your line.
   - Next, vertical lines should be drawn from where these lines intersect your lines to the x-axis. The space between these lines on the x-axis is the half-life.