Name_____ Pd_____ Date_____

Lab #_____ Understanding Half Life

Aim (3 points):

Materials (3 points):

Vocabulary (8 points):

Half life

Decay mode

Radioisotope

Nuclear Charge

Method:

1. Count the *m&m's*® in your cup. Write the number below..
2. Write down your starting time.
3. Place the *m&m's*® in the cup. Shake the cup and dump the *m&m's*® onto a paper towel.
4. Remove all *m&m's*® which have the "m" facing up. Record this number on the data table. These *m&m's*® represent decayed *m&m's®;* set these aside on the towel for later consumption.
5. Repeat step 3 until either 1 or 0 *m&m's*® remain.
6. Write down your ending time.
7. Determine the number of seconds it took to complete the experiment.
8. Divide the time by the number of trials to determine the half-life of your *m&m's*®.
9. Record the total elapsed time and the number of *m&m's*® remaining after each half-life in Table 2.
10. When your data Tables have been verified by the teacher, you may eat the *m&m's*®.

Data (10 points):

starting time_____ ending time_____ # seconds elapsed _____

Half life = $\frac{\text{total \# seconds}}{\text{\# of trials}}$ = $\frac{\text{\_\_\_\_\_ seconds}}{\text{trials}}$ = _____ seconds

Table 1 (data): (10 points)
Number of *m&m's you started with* _____

Table 2 (analysis): (10 points)
Half life of *m&m's*

Trial #	# of decayed *m&m's*		Half Life	Time (seconds)	Remaining *m&m's*
0	**0**		**0**	**0**	
			1		
			2		
			3		
			4		
			5		
			6		
			7		
			8		
			9		
			10		

Using Table 2 make a graph with a *best fit curve*. Put time in seconds on the X axis and number of m&m's® remaining on the Y axis. Be sure to put a title on your graph. (15 points)

Questions (3 points each):

1. **What did you determine the half-life of your m&m's® was? _____**

2. **Approximately what percent of m&m's® was removed at each trial?_____**

3. **Is it possible to predict which of the m&m's® will be "m" side up?_____**

   Explain_____

4. **Is it possible to predict approximately how many m&m's® will be "m" side up for each shake?_____ Explain._____**

5. **How would you describe the shape of your graph?_____**

6. **Suppose you started with 1000 m&m's®, about how many m&m's® would be removed in the first shake?_____**

7. **How would the shape of the graph from question #6 compare to the one above?**

_____

8. **Explain why the graph of the 1000 m&m's is similar or different**.

_____

9. **Describe how this lab simulates the half life of an element.**

_____

Regents Questions (next page) (14 points).