The Half Life of M&Ms

Name: Period:

Lab Partners: Lab Report Due Date:

Pre-lab Question

What is half life?

Background Information

Theoretical data is data that is calculated using math formulas and is based on theory. Experimental data is calculated when the actual situation or problem is performed as an experiment. In this case, you would perform the experiment, and use the actual results to determine the data.

Materials M&M's™ candies small cup piece of paper towel graph paper calculator

Procedure

1. Count the total number of M&M's given. Record this number on the Data Table. Place the M&M's™ chocolate candies in the cup. The candies will stand for atoms of a hypothetical radioactive element.

2. Carefully shake up the cup for 10 sec. (10 seconds is the half life for M&M's in this experiment)

3. Pour the M&Ms onto the paper towel (CAREFULLY!!) and take out any atoms (candies) that have "decayed," that is, **that are showing lettered sides down**. Count them. Record on the data table the numbers of remaining atoms. (Once decayed, they are now "safe" to eat.) Calculate the % Atoms still Radioactive. This is the first half life.

4. Place the atoms that didn't decay (candies with "m" facing up) back into the cup and shake for another 10-sec time interval. Record the number of "radioactive" atoms remaining. This is the 2nd half life.

5. Keep repeating time interval trials until all atoms have decayed. Add additional rows if needed. Calculate % Atoms still Radioactive for each half life.

Data Table

Half Life	Time (sec)	Radioactive Atoms Remaining	% Atoms still Radioactive
0	0		100%
1	10		
2			
3			
4			
5			
6			
7			
8			

6. Make a line graph of your data showing the average number of atoms remaining versus time (x axis).

Analysis questions:

1. After how long did it take for one-half of your "atoms" to decay?
2. Each shake represents a "half-life" for the "M&M" atoms. What does half-life mean?
3. What is the half-life of your "atoms"?
4. If the half-life model decayed perfectly, how many atoms would be left after 20 sec?
5. If you increased the amount of "atoms", would the overall shape of the graph be altered? Explain.
6. Using your graph, estimate the number of M&Ms that would be left after 4 seconds.
7. Does your data represent theoretical data or experimental data? Explain.