Name _____ Period _____

Lab 6 – Modeling Decay of Candium Isotopes 50 Points

Introduction

In this lab you be performing a simulation of nuclear decay using candium (*skittles or m&m*) particles. The goal of this lab activity is to model through graphing the decay process of nuclear isotopes through the graphing process. On average during each decay cycle a particle has an opportunity to decay. If the particle does decay it either becomes stable, or enters another part of the decay chain if still unstable.

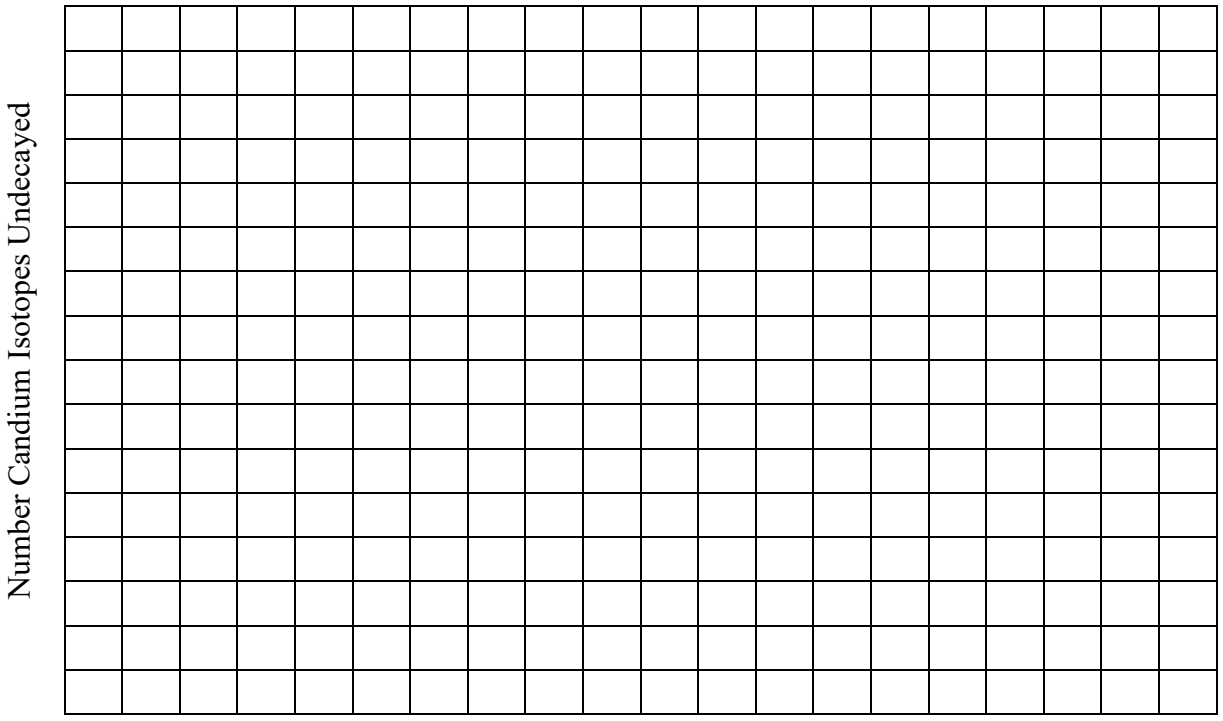
Procedure

1. Open your candium isotope bag, and but the isotopes into the provided ziplock bag. Lay the bag flat on the deck, and count the number of candium isotopes, and record the number of the data table.
2. Shake up the candium isotopes for at least 5 seconds, then with the bag closed, lay all the candium isotopes flat so you can see the writing on the side of the candy. Count the number of candium isotopes with the writing up, and remove them from the bag. Since these candium isotopes are not not radioactive, you way eat them. Replace the decayed candium particles with the non-radioactive beanium atoms from the last experiement.
3. Repeat the process until all the candium isotopes have decayed. If near the end you only have 2 or less isotopes that have not decayed, you can assume they decay on the next trial.
4. Write your data from your individual experiment on the board for the group totals.

Data Table For Candium Decay

Trial Number	0	1	2	3	4	5	6	7	8	9	10
Number of undecayed particles (*your sample*)											
Number of decayed particles (*your sample*)											

Graph of decayed particles over time to find the half-life of candium isotopes



Calculations

Using decay particle graph

Based on the graph above determine the number of throws expected to reach the number of decayed particles indicated on the data table below

Undecayed Particle Percentage	80%	60%	40%	20%
Number of Particles Undecayed* (*At given percentage*)				
Throws required to reach decayed amount (*from graph*)				

* Total Throws · (Decayed % / 100%)

Questions

1. Based on the graph above was the shape of the graph linear (*straight*) or was it another math based function? [*see examples on board*].

2. What does the equation for the graph tell us about the decay process of candium? Is the decay process linear (*same chance to decay each time*) or does it change as the decay process occurs?

3. Extension: What does the slope (Particles Decayed vs Trial Number) of the graph tell us about the decay process of the candium isotope?