

Half-Life and M&Ms Activity:

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Students' Guide

Goals

- To understand the concept of half-life
- To have a useful analogy that helps you to actually "see" the decay process, which is very abstract concept otherwise.

The Activity

M&Ms are used to simulate the decay of radioactive isotopes. Having two different sides, they represent the "radioactive" and the "decayed" elements. The decaying process is imitated by sequential discarding of the M&Ms, which fall "right side up" on the tabletop, until no M&Ms are left. A graph of the number of remaining candies vs. trial number should yield a measure of the "half-life."

Materials for Each Group

- Lunch tray
- Styrofoam cup
- 100 M&Ms candies

Instructions

Make sure you have 100 M&Ms with an M on one side of all candies, since it will affect your results.

Shake the M&Ms in the cup and dump them on the tray.

Remove all M&Ms which land with the M side up. Don't use them again.

Count the remaining candies. Record their number on your data chart, where it says Trial #1:

Trial #1	Trial #2	Trial #3	Trial #4	Trial #5	Trial #6	Trial #7	Trial #8	Trial #9	Trial #10

Put the remaining candies back in the cup, shake again, and repeat the process until you have zero candies left.

Graph the number of candies (y-axis) vs. the trial number (x-axis).

Determine the "half life" of the decay process: _____

Explain how you calculated it: _____

If the half-life of U_{238} is 4.5×10^9 , readjust your graph's scale for it and calculate how much U_{238} will be left after four half-lives: _____