STEM in the lab

Inspiring Idaho's future STEM workforce

HALF-LIFE OF M&MS

MISSION

Use M&Ms to demonstrate the process of half-life.

MATERIALS

- Cup of M&Ms
- Clean surface

GUIDING QUESTIONS

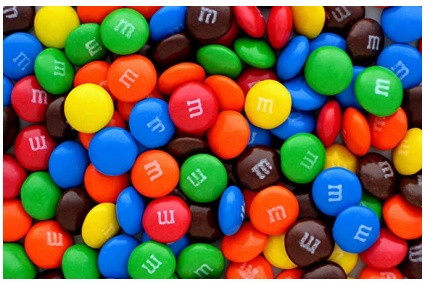
- What happens to the total number of candies with each trial?
- Does the number of candies started with affect the outcome?

TRY THIS AT HOME

- Graph the results of your experiment, what patterns do you notice?
- Ask other people to perform the experiment, compare their results to yours.
- What other items could you use to demonstrate half lives?

ABOUT THIS ACTIVITY

There are several types of fuels that we use every day. The **gasoline fuel** we use in our cars is one example. The fuel we use for our cars must be pumped out of the ground and refined from crude oil. Then it can be stored in tanks for us to use. Another type of fuel is **nuclear fuel**. To use this fuel, Uranium 238 is mined and processed to make U-235 pellets. These pellets are stacked into fuel cells and are put into a nuclear reactor's core. When these uranium atoms absorb a neutron, they split giving off tremendous amounts of energy along with more neutrons. The fuel is generally "used up" after 1.5 to 3 years, and it must be stored or reprocessed.



The amount of time it takes a radioactive isotope to decay into a stable isotype is different for each isotope. This time is called **half-life.** The half-life of an isotope is the time on average that it takes for half of the atoms in a sample to decay. As an isotope decays, it can transform through a number of elements until they end up as a stable isotope. In this activity, candy will be used to demonstrate the process of half-life.

INSTRUCTIONS

1. Count the number of M&Ms in your cup.
2. Dump out the cup of M&Ms onto a clean surface.
3. Remove all the candies that are face up (with the M showing). These have "decayed".
4. Make a data table and record the number of decayed candies. Table should have 3 columns: shake, decayed M&Ms, remaining M&Ms (see below).
5. Place decayed M&Ms to the side and put the rest of the candy back in the cup.
6. Repeat steps 1-4 again until all the candy is gone.

SHAKE	DECAYED M&MS	REMAINING M&MS
1		
2		
3		

RESOURCES

» **STEM Help Wanted**
https://public.inl.gov/STEMHelpWanted/Brochure/index.aspx?page=16

» **Nuclear Fuels: Definition, Characteristics & Examples**
https://study.com/academy/lesson/nuclear-fuels-definition-characteristics-examples.html

» **TeachNuclear Lesson Plans**
https://teachnuclear.ca/all-things-nuclear/radiation/radioactive-decay/half-life/

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