

Scientist: \_\_\_\_\_

Per: \_\_\_\_\_ Date: \_\_\_\_\_

# Isotopes and Atomic Mass!

**Isotopes** are atoms that have the same number of protons but have different numbers of neutrons.

$$\text{Average Atomic Mass} = \frac{\text{Mass}}{\text{Amount}} \quad \% \text{ abundance} = \frac{\text{amount of isotope}}{\text{total amount of isotopes}}$$

## Objective:

In this experiment you are going to assume that each color of m&ms is a different element and each m&m is an atom.

- Calculate the average atomic mass of the “element”
- The atomic mass of the isotopes
- The % abundance of each isotope.

**Materials:** Triple beam balance, a baggie of m&ms, and a calculator

In this experiment, there are two isotopes for each element. Assume the baggie of m&ms is an accurate sampling of that element.

**Data:** Fill in the data table. The gray boxes indicate data that is calculated using the above equations.

Color of m&ms \_\_\_\_\_

	Total m&ms	Isotope #1 (Peanut m&ms)	Isotope #2 (Plain m&ms)
Mass			
Amount			
Atomic Mass			
% abundance of isotope			

1. Mass all of the m&ms together using the triple beam balance.
2. Count the total number of m&ms.
3. Separate the peanut m&ms from the plain m&ms.
4. Mass the peanut m&ms. Count the number of peanut m&ms.
5. Calculate the mass of the plain m&ms. Calculate the amount of plain m&ms.
6. Calculate the atomic mass of the m&ms.
7. Calculate the atomic mass of the peanut and plain m&ms.
8. Calculate the % abundance of each isotope (peanut and plain m&ms).

**Remember:** Elements are defined by the number of protons.