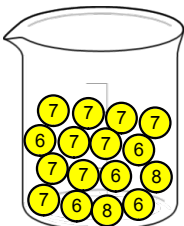


**A Weighted Average is...**

A way to find an average using **percentages**

Using Percent:  
 $\% = \text{Part} / \text{Whole} \times 100$

What is the percent of 7's in the beaker?



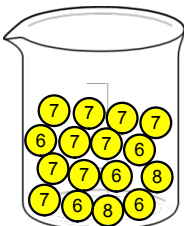
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**A Weighted Average is...**

A way to find an average using **percentages**

Using Percent:  
 $\% = \text{Part} / \text{Whole} \times 100$

What is the percent of 7's in the beaker?

$$\frac{9}{16} \times 100\% = 56\%$$


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## Terms

Mass Number	Average Atomic Mass
= protons + neutrons	average mass of all the atoms of an element
mass of 1 atom	decimal number
whole number	on the periodic table
not on the periodic table	

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## Calculating Average Atomic Mass

$$\text{Abundance}_1 \times \text{Mass}_1 + \text{Abundance}_2 \times \text{Mass}_2 \dots$$


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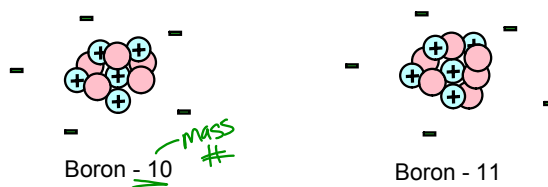
Mass is usually measured in **amu** (atomic mass units)  
 Abundance is a **percent** written as a decimal  $80\% = .80$

- Abundance is the percentage of time that a particular isotope occurs in nature
- Average atomic mass is closest in mass to the **most abundant** isotope & between the masses of the smallest and largest isotopes

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**Example #1** - Chlorine has two naturally occurring isotopes, chlorine-35 and chlorine-37. The average atomic mass for chlorine is 35.453. Without doing any calculations, which isotope is more abundant? Why?

**Example #2:** Calculate the average atomic mass of Boron.



19.9% Abundance

80.1% Abundance

$$\begin{aligned} \text{avg. at. mass} &= (\text{mass} \cdot \text{abund})_1 + (\text{mass} \cdot \text{abund})_2 \\ &= (10 \cdot .199) + (11 \cdot .801) = 10.801 \end{aligned}$$

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**Example #3:** Naturally occurring chlorine that is put in pools is 75.53 percent chlorine-35 and 24.47 percent chlorine-37. Calculate the average atomic mass.

$$\begin{aligned} \text{a.a.m.} &= (35 \times .7553) + (37 \times .2447) \\ &= 35.4894 \text{ amu} \end{aligned}$$

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