Atomic Mass (A.M.) - lower # w/ decimals on the periodic table

- the mass of an element comes from the masses of all the p^+, n^0, & e^- inside the atoms.

atomic mass is a weighted average mass of the mass of each isotope & their % abundance

$$A.M. = \left(\text{mass}_{\text{isotope 1}} \cdot \%\text{isotope 1}\right) + \left(\text{mass}_{\text{isotope 2}} \cdot \%\text{isotope 2}\right)$$
$$+ \left(\text{mass}_{\text{isotope 3}} \cdot \%\text{isotope 3}\right) + \ldots.$$

Ex) Gallium has 2 isotopes, the first has a mass of 68.925881 amu (atomic mass units) and an abundance of 60.108%. The 2nd has a mass of 70.924705amu and an abundance of 39.892%. Calculate the atomic mass.

$$A.M = (68.925881_{\text{amu}} \cdot .60108) + (70.924705_{\text{amu}} \cdot .39892)$$

$$= 69.723235187 \text{ amu}$$

$$= 69.72 \text{ amu}$$

Ex) Calculate the atomic mass of Ne, w/ 3 isotopes

isotope	mass (amu)	abundance
^{20}Ne	19.9924	90.48%
^{21}Ne	20.9938	.00.27%
^{22}Ne	21.9914	9.25%

$$A.M. = (19.9924_{\text{amu}} \cdot .9048) + (20.9938 \cdot .0027)$$
$$+ (21.9914 \cdot .0925) = 20.18 \text{ amu}$$

Ex) Copper has 2 isotopes, calculate the atomic mass

isotope	mass (amu)	abundance
^{63}Cu	62.9298	69.09%
^{65}Cu	64.2233	30.91%

Ex) Neon has 3 isotopes. Find its atomic Mass.

Isotope	Mass (amu)	Abundance
^{20}Ne	19.992440	90.48% = .9048
^{21}Ne	20.993847	.27% = .0027
^{22}Ne	21.991386	9.25% = .0925

A.M. = (19.992440 amu · .9048) + (20.993847 amu · .0027)
+ (21.991386 amu · .0925)
= 20.18 amu
20.1800463

Ex) calculate the atomic mass of sulfur

Isotope	Mass (amu)	Abundance
^{32}S	31.972	95.00%
^{33}S	32.971	.76%
^{34}S	33.967	4.22%

32.057387 amu

32.06 amu