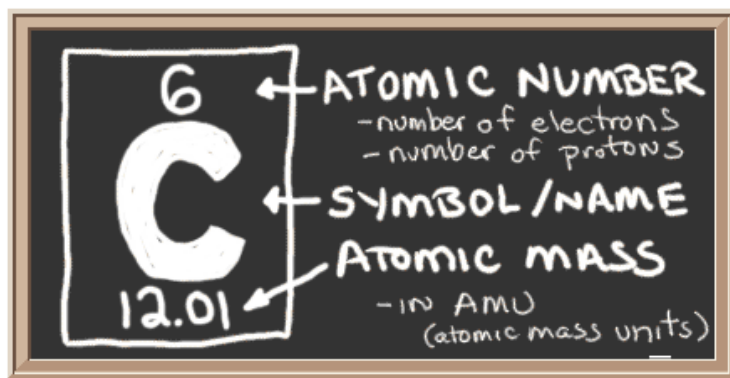




Atomic Number = Number of Protons =
Number of electrons (in a neutral atom)



How many protons and electrons are in an atom
of gold?

79!



Mass Number = protons + neutrons

-> Applies to individual atoms only!

Notation Alert

-> Element name - Mass number Ex: Carbon-14



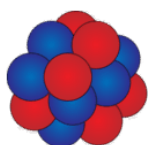
Determine the number of protons, neutrons, and electrons in a neutral atom of mercury-204

$$P = 80 \quad e = 80$$

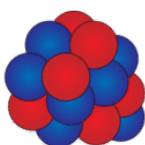
$$204 - 80 = 124 \text{ neutrons}$$



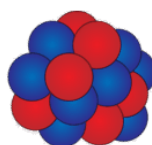
Isotopes - Same atom (protons and electrons) but different neutrons -> different mass number



Carbon-12
98.9%
6 protons
6 neutrons



Carbon-13
1.1%
6 protons
7 neutrons

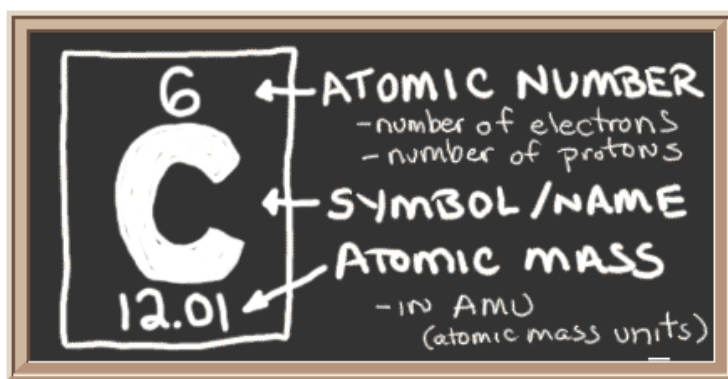


Carbon-14
<0.1%
6 protons
8 neutrons



Atomic Mass - The average mass number of every element of an atom in the universe! (includes isotopes)

-> More abundant isotopes have a greater mass contribution!



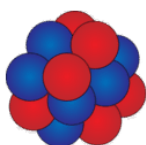


Mass contribution = (isotope mass)(% abundance)

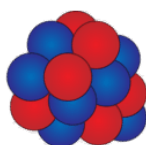
$$= 12(.989) = 11.9$$

$$+ = 13(.011) = .14$$

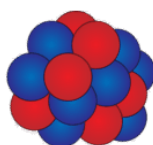
$$= 14(.00011) = .0015$$



Carbon-12
98.9%
6 protons
6 neutrons



Carbon-13
1.1%
6 protons
7 neutrons



Carbon-14
<.01%
6 protons
8 neutrons

$$\approx 12.04$$

Atomic Mass = sum of mass contributions