2 REGIONS OF THE ATOM

- Nucleus
- Electron Cloud

3 **PARTS** OF THE ATOM
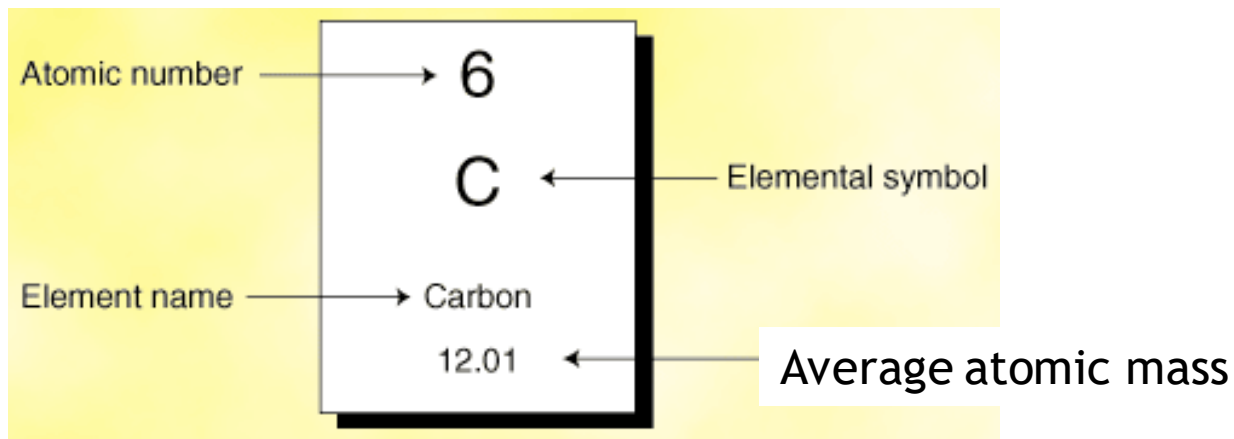
- Protons
  - ▪
  - ▪
  - ▪

- Neutrons
  - ▪
  - ▪
  - ▪

- Electrons
  - ▪
  - ▪
  - ▪

Atomic number

C ← Elemental symbol

Element name → Carbon

12.01 ← Average atomic mass

- Atomic number =

- Average atomic mass:

- #protons = #electrons

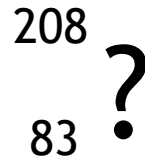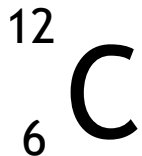| Element	Atomic #	Ave. Atomic mass	Mass #	Protons	Neutrons	Electrons
Boron						
Lead						

$$^A_Z X$$
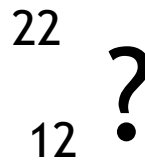
X =

Z =

A =

NUCLEAR SYMBOL

- What is the name of following?

$${}^{14}_{7}N$$

$${}^{14}_{6}C$$

$${}^{238}_{92}U$$

$${}^{22}_{12}?$$

$${}^{12}_{6}C$$

$${}^{208}_{83}?$$
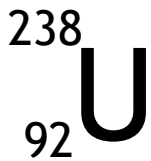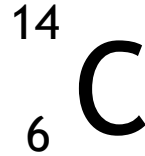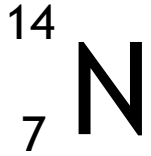
ISOTOPES

- Same element with different

  -

- Average Atomic Mass on periodic table
  - An average based on percent of occurrence of the different mass numbers
  - EX: Lithium-7, Lithium-8, Lithium-6
  - The periodic table reflects

Element	Atomic #	Ave. Atomic mass	Mass #	Protons	Neutrons	Electrons
Carbon -12						
Carbon -14						
Gold - 199						
Gold - 196						

IONS

- Same element with

- Neutral atom:
  - ▪

- Cation
  - ▪

  - ▪

- Anion
  - ▪

  - ▪

DON'T COPY DOWN!

- Pg 114 Red Book
  - Sulfur sample
    - Sulfur – 32 = 95.002%
    - Sulfur – 33 = 0.76%
    - Sulfur – 34 = 4.22%
    - Sulfur – 36 = 0.014%
- What is the most common isotope of Sulfur?

- How does the most common isotope relate to the periodic table?

CALCULATING AVERAGE ATOMIC MASS

1.

2.

3.

EXAMPLE ISOTOPE PROBLEM

- Sulfur sample
  - Sulfur – 32 = 95.002%
  - Sulfur – 33 = 0.76%
  - Sulfur – 34 = 4.22%
  - Sulfur – 36 = 0.014%

- Solution
  - 32 x .95002 =
  - 33 x 0.0076 =
  - 34 x 0.0422 =
  - 36 x .00014 =

  - Add them:
    -
    -

PRACTICE PROBLEM

- Element X has two isotopes.
- The isotope with a mass of 10.012 amu has an abundance of 19.91%.
- The isotope with a mass of 11.009 amu has an abundance of 80.09%.
- Calculate the average atomic mass of element X.

HONORS PROBLEM

- Element X has an average atomic mass of 110.60 amu. If element X has 2 isotopes that have a mass of 109.90 amu and 110.88 amu, what is the % of the two isotopes?