

Earth Science

With

Mr. Thomas



Atomic Structure

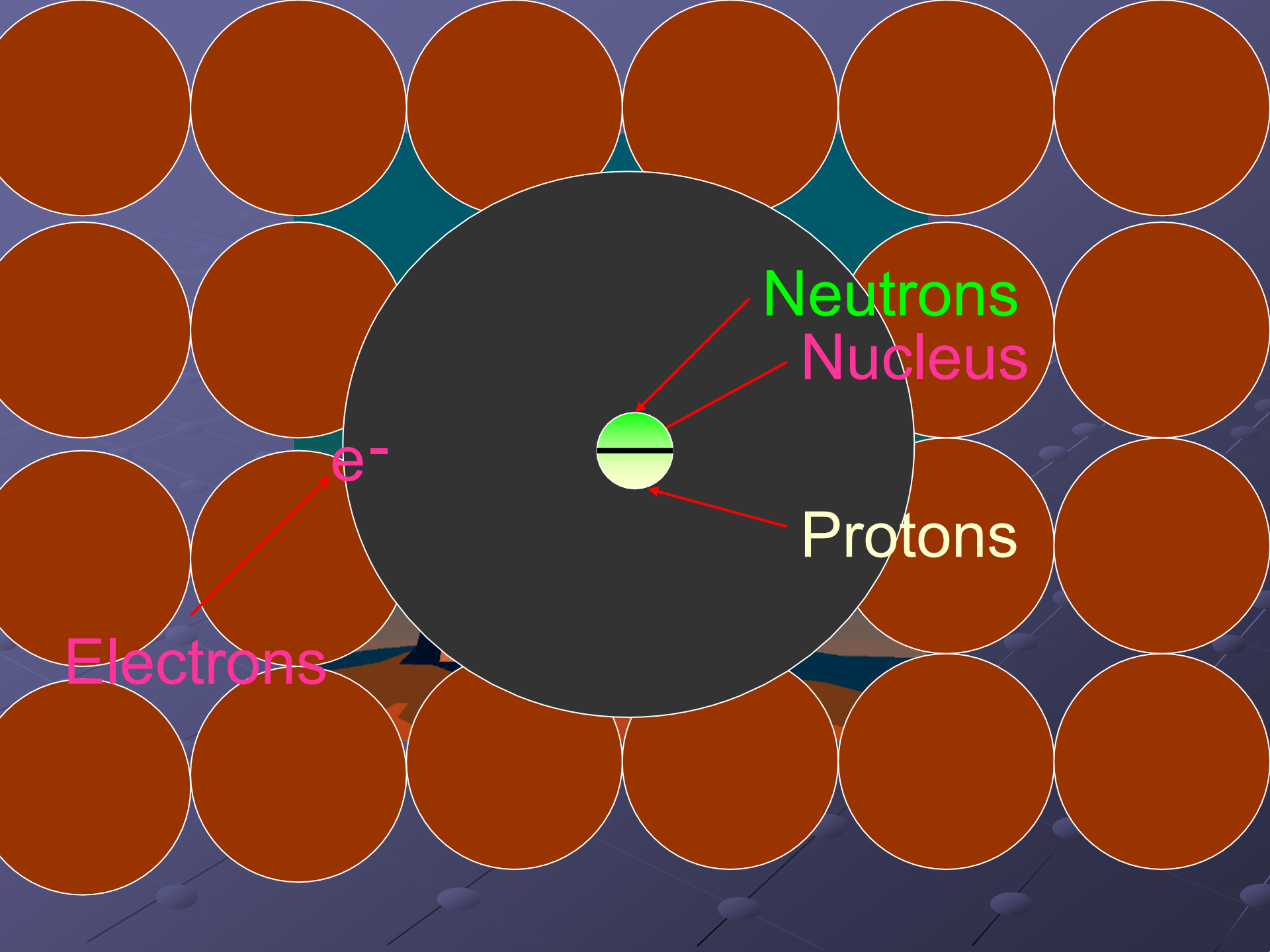
Matter: Anything that has *mass* & *volume*.

Matter is made up of **Elements**.

(a substance that cannot be broken into simpler substances – oxygen, carbon, hydrogen, etc.)

Elements are made up of **Atoms**.

Atoms are made up of **Electrons,
Protons, & Neutrons**.



Neutrons

Nucleus

Protons

e^-

Electrons

Structure of an Atom

- The Nucleus:
 - Contains **Protons** (+ charge) and **Neutrons** (no charge)
 - When an atom is neutral:
 - # Electrons = # Protons
 - # of Protons = **The Atomic #**
- For atoms with more than 2 electrons:
 - **Electrons are split into energy levels.**

2, 8, 18, 32, 21, 9, 2

Element Classification

Isotope: Atoms of an element that have *different masses*.

Symbol

${}^6\text{C}$

Atomic Mass = Protons + Neutrons

Example: Carbon

12.011

Carbon atom with 6 Protons & 2 Neutrons

Vs.

Atomic Mass

(Average)

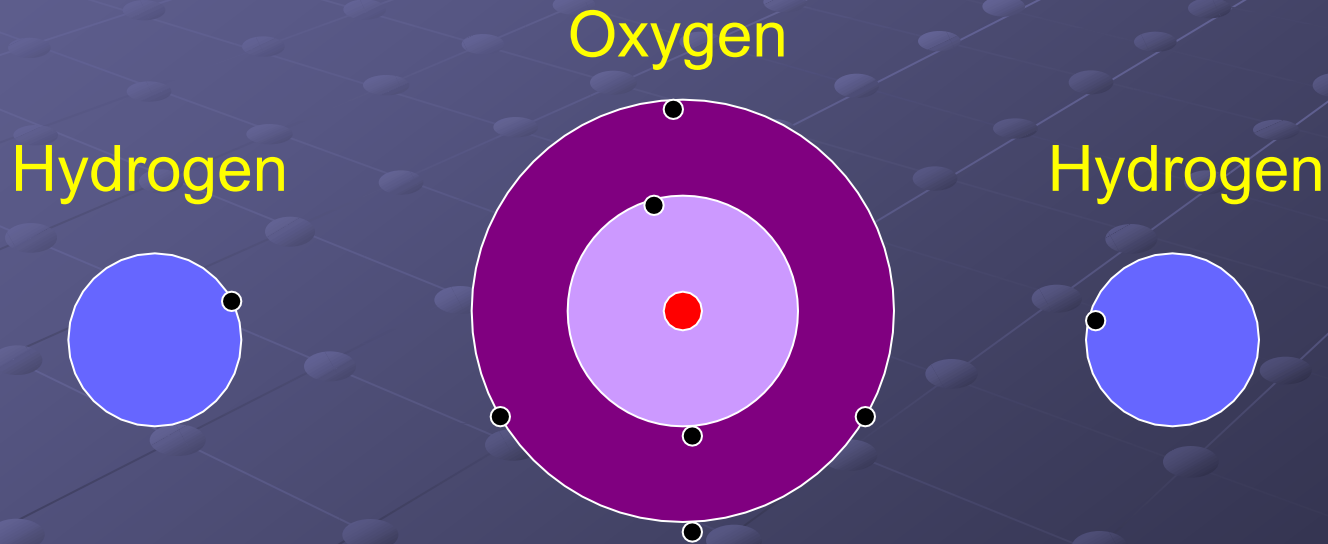
Carbon atom with 4 Protons & 1 Neutron

Bonds

- Most substances on earth are not pure elements, but rather compounds, or several elements bonded together.
- There are 3 types of bonds:
 - Covalent
 - Ionic
 - Metallic

Bonds - Covalent

“Co” means to share, and in this case, the sharing of electrons:



WATER!!

Bonds - Ionic

“Ion” means charged, and in this case, (+) & (-) charged atoms:

Sodium

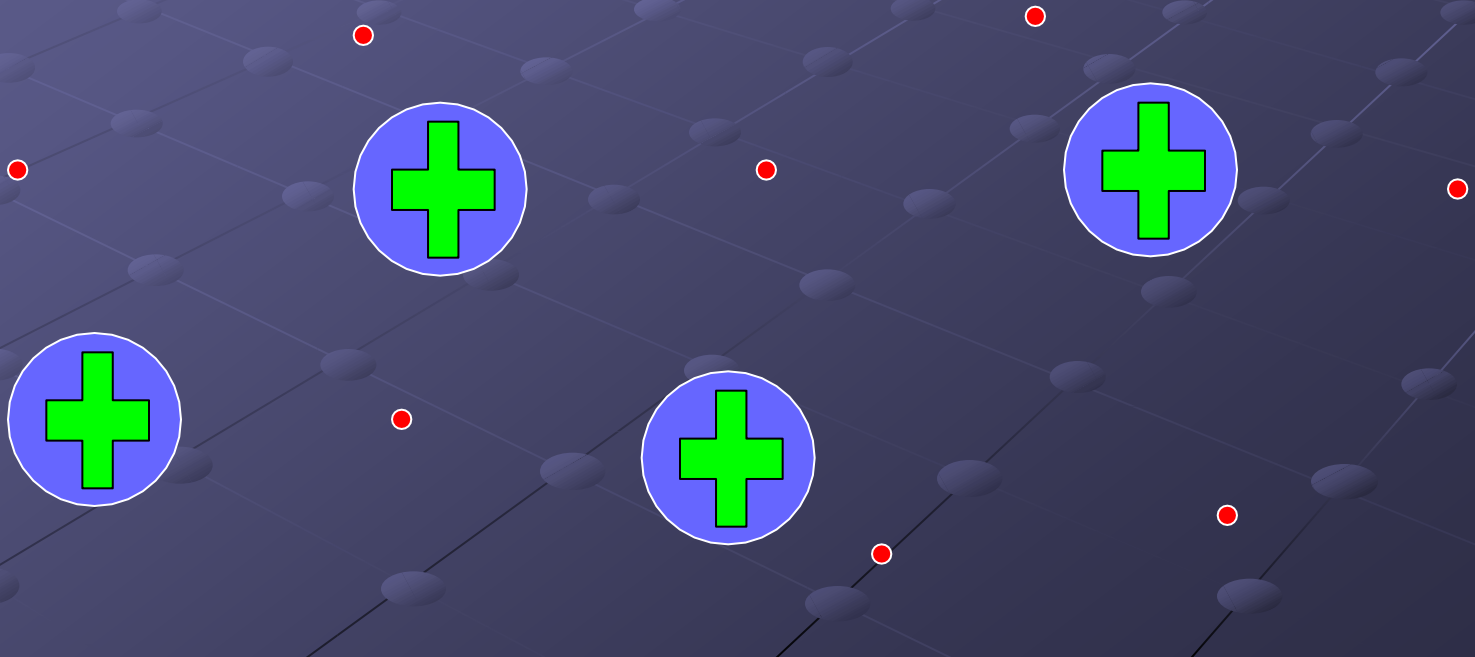
Sodium Chloride

Chlorine



Bonds - Metallic

These bonds are unique in that the electrons are free to “roam” around the positive ion nucleuses like a sea of electrons:



That's it