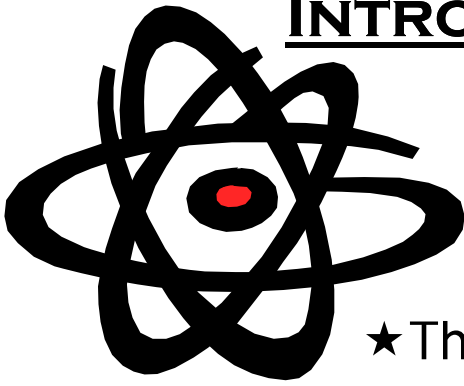


INTRODUCTION TO BIOCHEMISTRY



★ Everything in the universe is either matter (stuff) or energy (light, heat)

★ The smallest unit of matter is the atom

★ Atoms are made of three particles:

1. Protons

2. Neutrons

3. Electrons

★ Nucleus: contains protons and neutrons

Atomic number = number of protons

★ Electrons are located in the electron cloud (fuzzy area around the nucleus)

★ Electrons are tiny compared to protons and neutrons, so most of an atom is empty space!

★ Electrons travel around the nucleus in specific ways:

☞ First level = max. of 2 electrons

☞ Second level = max. of 8 electrons

★The first 4 electrons stay as far away from each other, then they start to pair up

Example: Nitrogen

All atoms are 😊 happy 😊 when their levels are FILLED

★Periodic table: list of elements in order by atomic number

★Element = substance made up of only 1 type of atom

☞ *Examples?*

★What are the elements that make up life?

C	P
H	S
N	K
O	Ca

★Compound = substance made up of more than one type of atom

☞ *Examples?*

★Molecule = substance with more than one atom in it; may be an element or a compound

☞ *Examples?*

★Chemical formulas use the symbols on the periodic table to represent molecules...

- O_2 = oxygen
- CO_2 = carbon dioxide
- H_2SO_4 = sulfuric acid



How do compounds form?

They form through chemical bonds.

1. Ionic bond

- ✓ ion = charged particle
- ✓ "opposites attract"
- ✓ one atom gains electron(s) and another atom loses electron(s)
- ✓ *example.... sodium chloride (NaCl)*

2. Covalent bond

- ✓ electrons are shared
- ✓ strongest type of bond
- ✓ *example: carbon dioxide (CO₂)*

3. Hydrogen bond (polar bond)

- ✓ polar molecules have a slight negative charge and a slight positive charge on opposite ends
- ✓ Different molecules are weakly bonded together between negative and positive ends
- ✓ *example: water (H₂O)*



ACTIVITY

You need:

- 2 small pieces of paper
- 1 large piece of paper
- colored dots (protons and neutrons)
- small stars (electrons)
- compass
- pencil

Procedure:

1. Make a hydrogen atom molecule on one small piece of paper. Use one color of dots to represent the proton. Hydrogen is special, it has no neutrons. Use any color star for electrons.
2. Label the protons (+) and electrons (-). Write "hydrogen" in the top right corner.
3. Repeat steps 1 and 2 on the other small piece of paper.
4. Make an oxygen atom on the large piece of paper. Use another color of dots for neutrons.
5. Write "oxygen" in the top right corner.