Elements

Atoms

Atom = the smallest unit of matter that retains all of the chemical properties of an element. Composed of two regions: the **nucleus** (which is in the centre of the atom and contains **protons** and **neutrons**), and the outermost region (holds its **electrons** in orbit around the nucleus).

The 4 elements common to all living organisms are: oxygen (O), carbon (C), hydrogen (H), + nitrogen (N).

Molecules

A **molecule** is formed when two or more atoms join together.

Chemical bond = a force that holds together the atoms of molecules. Bonds in molecules involve atoms sharing electrons.

Compounds

A compound is formed when two or more different elements combine in a fixed ratio by mass. The composition of a compound is always the same.

Biochemical Compounds

Biochemical Compounds = The compounds found in living things.

Why is carbon so basic to life? Carbon's ability to form stable bonds with many elements, including itself. This property allows carbon to form a huge variety of very large and complex molecules.

Polymers = Very large molecules, built of repeating units of smaller compounds called **monomers**.

All biochemical compounds contain the elements carbon, hydrogen, and oxygen. Some contain only these elements; others contain additional elements as well. The vast number of biochemical compounds can be grouped into four major classes: carbol o traces, ripids, proteins, and nucleic acids.

Chenital Relations

Reactions occur when atoms combine or separate from other atoms. When some atoms dissolve in water they become charged particles called **ions**, either positively or negatively charged. Ions may have one, two or sometimes three charges. Positive Ions = e.g. H+ Hydrogen Negative Ions = e.g. OH- Hydroxyl Positive and negative ions attract one another to hold compounds together. They conduct electricity when dissolved in water. Substances that ionize in this way are known as **electrolytes**.

Organic and Inorganic Compounds

The molecules in an animal's body fall into two groups: inorganic compounds and organic compounds.

Inorganic compounds: do not contain carbon. E.g. water, sodium chloride, potassium hydroxide. Water is the most abundant, making up 60% of the volume of cells and 90% of body fluids. Other compounds help keep the pH balance and concentration of the blood and other body fluids stable

Organic compounds e.g. carbohydrates, proteins and fats/lipids. All contain carbon atoms and they tend to be larger and more complex molecules, largely because each carbon atom can link with four other atoms. Can consist of from one to thousands of carbon atoms joined to form chains, branched chains and rings. All organic compounds also contain hydrogen and may also contain other elements.



