Elemental Composition of Human Body

Atom	Percentage in the Body
Oxygen	65
Carbon	18
Hydrogen	9.5
Nitrogen	3.2
Calcium	1.5
Phosphorus	1.2
Potassium	0.4
Sulfur	0.2
Sodium	0.2
Chlorine	0.2
Magnesium	0.1

trace elements are boron (B), cadmium (Cd), chromium (Cr), cobalt (Co), copper (Cu), fluorine (F), iodine (I), iron (Fe), manganese (Mn), molybdenum (Mo), selenium (Se), silicon (Si), tin (Sn), vanadium (V), and zinc (Zn)

Characteristics of Living Things

all living things...

- are made up of one or more cells
- they require an energy source
- grow and change over time
- reproduce by making copies of themselves or by having offspring
- respond to changes in their environment

Monomers & Polymers

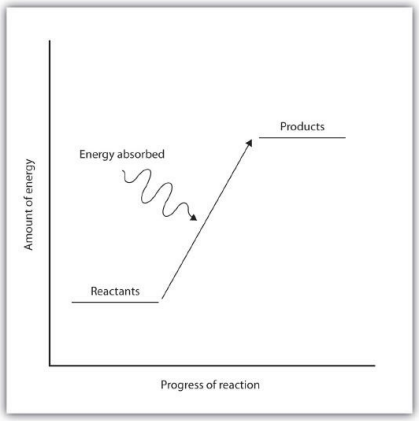
Molecules in the Body

Molecule	Molecular Formula
Carbon Dioxide	CO2
Water	H2O
Glucose	C6H12O6
Adenosine Triphosphate (ATP)	C10H16-N5O13P3
Amino acids	

Properties of Water

- water is polar; hydrogen (+) and oxygen (-)
- hydrogen bonding
- water is an excellent solvent "universal solvent"
- cohesion (tendency of water to stick to itself)
- adhesion (tendency of water to sticks to other substances)
- high specific heat
- hydrophilic (water loving) and hydrophobic (water fearing)
- states of water: gas, liquid, solid
- pH (power of hydrogen) indicates the acidity or alkalinity of a solution

Endothermic Reactions



"endo" means inside. In an endothermic reaction, energy is used as an input
-heat is absorbed by reactions to create the products-the surroundings become colder
-reactants are lower in energy than the products
-these reactions in living systems are called anabolic reactions-building bigger molecules from smaller ones Ex: amino acids into proteins

Eukaryote v Prokaryote

Eukaryote	Prokaryote
Ex: animal, plant, fungus, protists	Ex: bacteria, archaea
DNA is stored within the nucleus	lacks distinct nucleus; DNA floats freely within cell
membrane bound organelles	no organelles

both prokaryotes and eukaryotes contain cell membranes, DNA, ribosomes, and cytoplasm

Properties of Carbon

found in living things

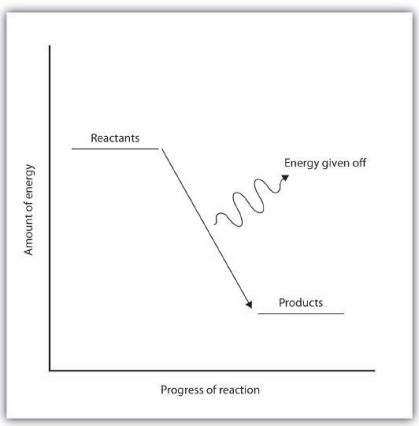
forms up to four bonds (usually bonding with C, H, O, N, and P)

forms single, double, and triple bonds

forms long chains and ringed structures

primary component in Macromolecules: lipids, proteins, carbohydrates, and nucleic acids

Exothermic Reactions



"exo" means outside. In an exothermic reactions, energy is an output
-heat is released so the surroundings become hotter
-products are lower in energy than the reactants
-these reactions in living organisms are called catabolic reactions-molecules are broken down to release energy Ex: glucose into energy