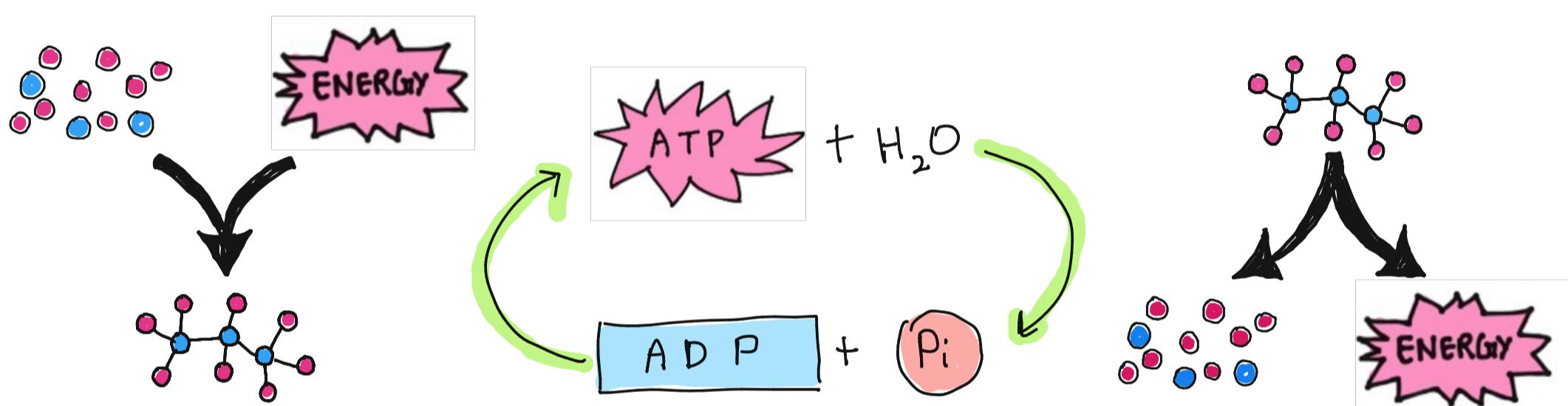


Metabolism

Processes of metabolism depend on the nutrients that get digested to produce energy. This energy is synthesized nucleic acids, proteins and other biomolecule in our body.

Metabolism is related to nutrition and the existence of nutrients. Bioenergetics describes the metabolism as the biochemical pathway through which the cells obtain energy. One of the major aspects is the energy formation.



ANABOLISM

In the process of building large molecules small molecules uses energy.

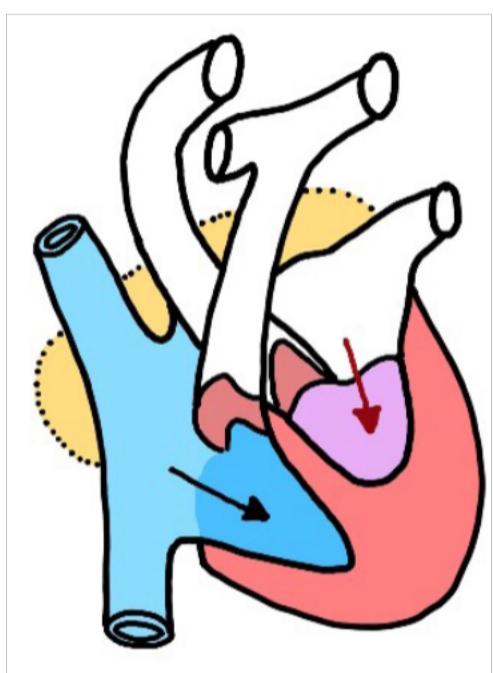
CATABOLISM

In the process of breaking down smaller compounds release energy



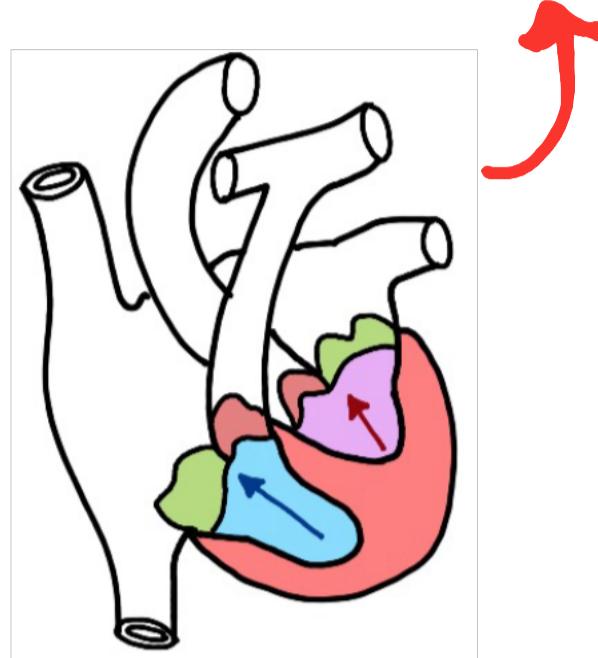
Atrial Systole

Atria contracts and a small amount of blood enters the ventricles



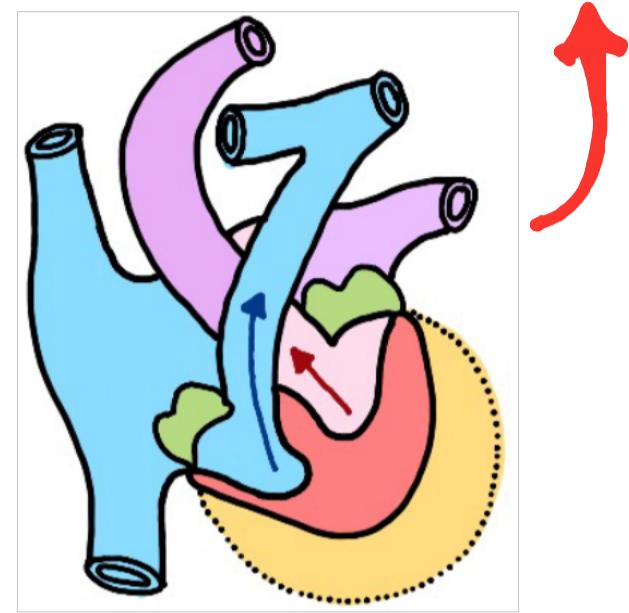
Isometric contraction

Closed valves induce isometric contraction, increasing ventricular pressure



Ejection period

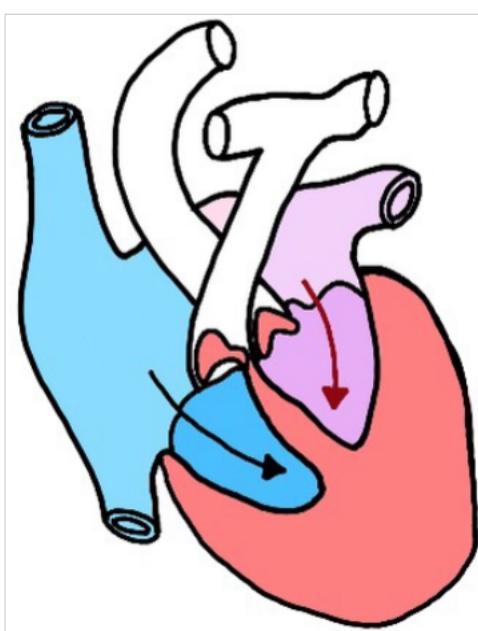
Semilunar valves are opened. Contract and blood is ejected out.



Cardiac Cycle

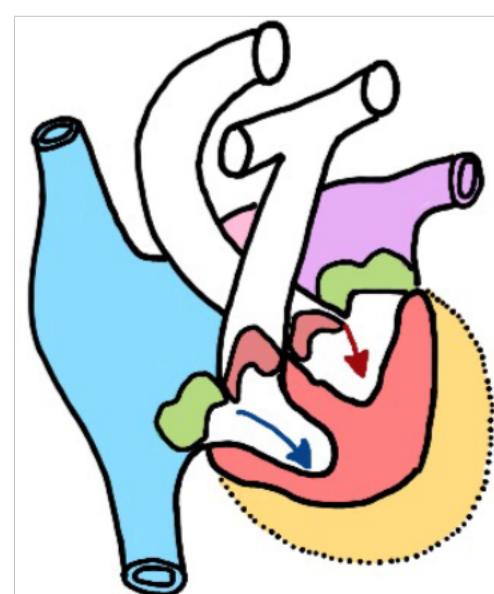
Rapid and slow filling

Atrioventricular valves are opened. Ventricles relax and filling occurs.



Isometric relaxation

Closed valves lead to isometric relaxation, reducing ventricles Pressure



Protodiastole

First stage of diastole. Semilunar valves closed, marking the end.



Atoms

THE NUCLEUS It is in the middle of the atom and it contains Protons and neutrons. It has a Positive charge because of the Protons. The nucleus is held together by the strong nuclear force, which overcomes the electrostatic repulsion between the Positively charged Protons

THE PROTONS

- Protons: Positive subatomic Particals in an atom's nucleus
- Proton count defines elements and their Properties

THE NEUTRONS

- Neutrons are uncharged Particals in the nucleus of an atom.
- They have a neutral charge, meaning they are neither Positively nor negetively charged.

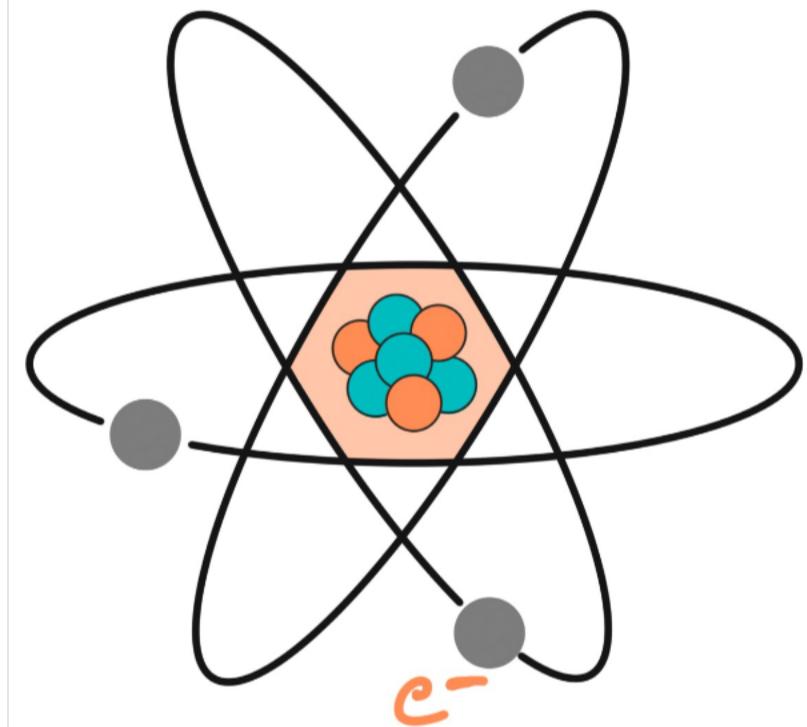
Atomic numbers = number of protons

Mass number = number of Protons + number neutrons

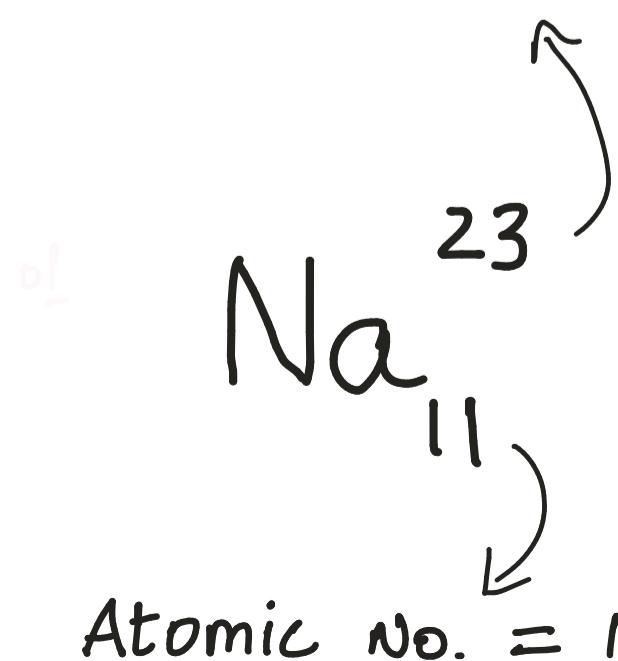
Number of electrons = atomic number

Anion = negatively charged

cation = Positively charged



Mass No. = 23



CARBOHYDRATES

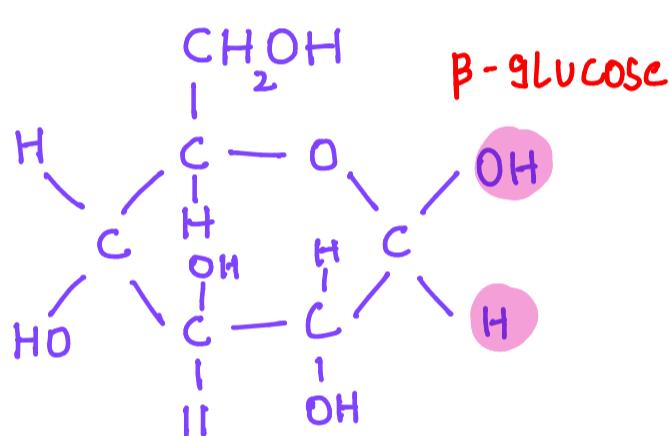
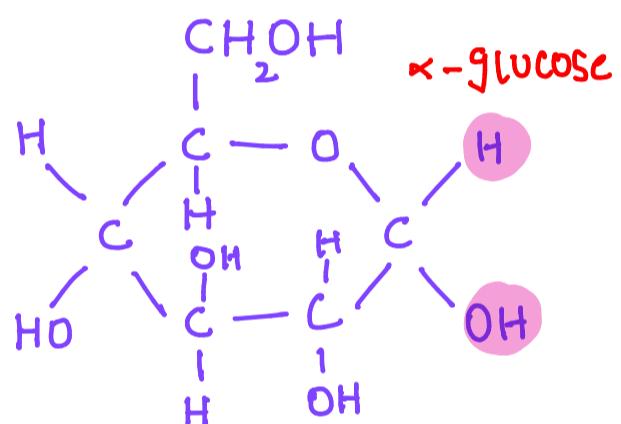
Carbohydrates carbon, hydrogen and oxygen, usually with the general formula $C_n H_{2n} O_n$

GLUCOSE

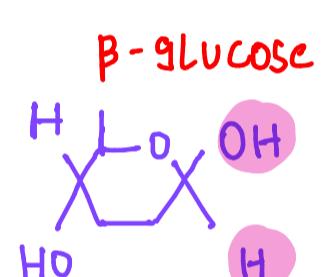
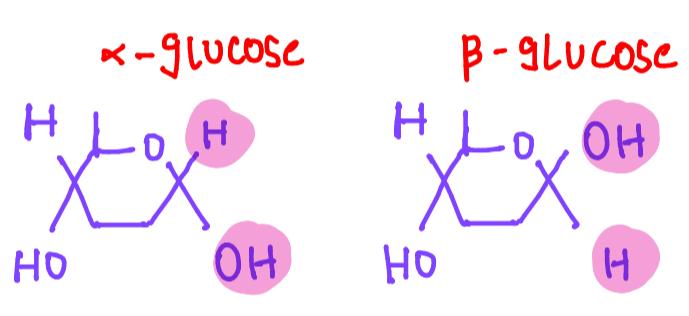
- A monosaccharide with the formula $C_6 H_{12} O_6$
- A hexose monosaccharide in a ring structure soluble in water → easily transported
- Two isomer: α -glucose and β -glucose

Monosaccharides are small soluble carbohydrate monomer.

Displayed formula:

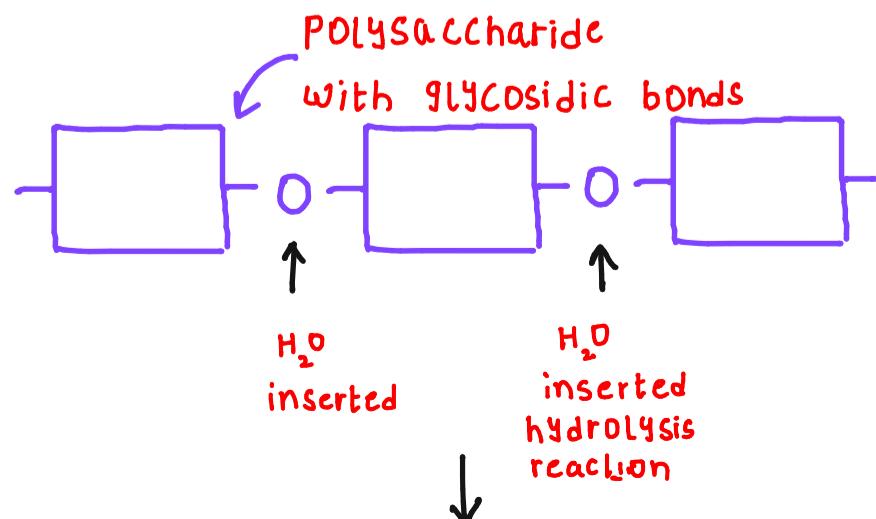
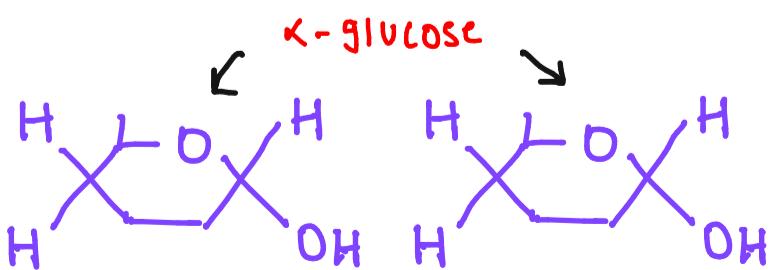


Skeletal formula:



GLYCOSIDIC bonds and condensation/hydrolysis reactions

- Condensation reaction two molecules join to form a new chemical bond and a water molecule is released
- Condensation reaction from glycosidic bonds between monosaccharides to creates disaccharides and polysaccharids
- Hydrolysis reaction: a water molecule is inserted and the chemical bond is broken.



Electromagnetism

Electricity & magnetism lie at the foundation of all everyday Phenomena

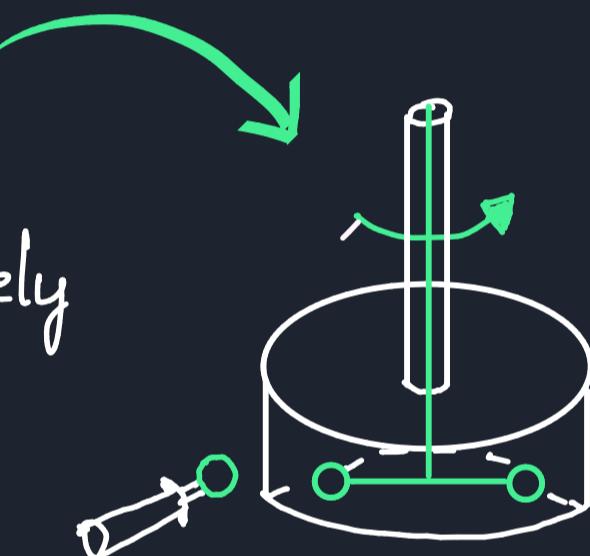
Coulomb's law & charge

- Early experiments rub amber and wool
 - ↳ amber & wool attract together
 - ↳ wool repels wool
 - ↳ amber repels amber



Coulomb's Experiment

- 1) measured the force from charge precisely
 - Put charge on with spheres
 - measured the force between them with a torsion balance



> charges $\rightarrow q_1$ in coulombs (C)

> distance $\rightarrow r$ magnitude
 $\nwarrow \hat{r}$ direction

> r_{21} \rightarrow distance from q_1 to q_2

> \hat{r}_{21} \rightarrow direction from q_1 to q_2

> Coulomb's Constant $\rightarrow K = 8.99 \times 10^9 N m^2 C^{-2} = \frac{1}{4\pi\epsilon_0}$ $\epsilon_0 = 8.854 \times 10^{-12} N^{-1} m^{-2} C^2$

Coulomb's Law

$$\vec{F}_{21} = K \frac{q_1 q_2 \hat{r}}{r^2}$$

force on 2 from 1