

EOC Review Part 2

Physical and Chemical Basis of Life

Basic chemistry

What are chemical bonds? What are the major types?

Interactions that keep atoms bound to one another. Ionic bonds occur when electrons are lost by one atom (metal) and gained by another atom (non-metal). Covalent bonds occur when two non-metals share one or more pairs of electrons.

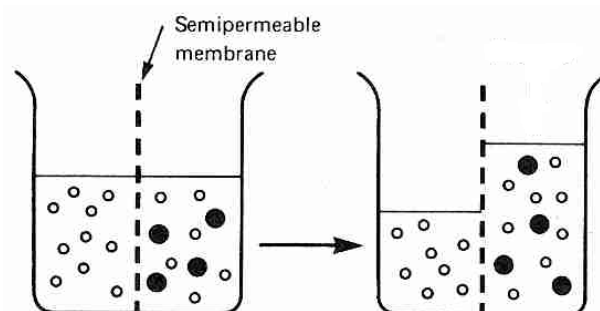
What do the lines between chemical symbols represent?

Shared electrons

What are valence electrons and how are they involved in bonding?

Valence electrons are the outermost layer of electrons. They are involved in chemical bonding.

Use the diagram to the right to answer the following four questions:



Why did the large dark molecules NOT move to the left?

The membrane is selectively permeable.

If the dark molecule is starch, where is the starch concentration greatest *at first* (left or right)?

Right

If the white molecule is water, where is the water concentration greatest *at first* (left or right)?

Left

If the dark molecules could move, in what direction would they diffuse? Why?

To the left. Molecules always diffuse from high to low concentration.

In osmosis, water moves from an area of _____ **higher** to an area of _____ **lower** water concentration. (Fill in with the word "higher" or "lower")

Which way will water move in each of the following situations (into or out of the cell):

- Salt inside the cell 65% and outside the cell 40%.
Into the cell.
- Sugar inside the cell 27% and outside 80%.
Out of the cell

Complete the table:

	Passive Transport	Active Transport
Requires energy?	No	Yes
Low to high concentration or high to low concentration?	High to low	Low to high
Examples	Osmosis, diffusion	Pumps, endocytosis, exocytosis

Macromolecules

Complete the tables:

Macromolecules	Function(s)	Monomer	Examples
Carbohydrates	Short Term Energy Storage, Cell Structures	Monosaccharides (glucose, fructose, etc)	Starch, Cellulose, Sucrose
Proteins	Makes up tissues & other body structures (hair, nails); includes enzymes	Amino Acids	Amylase, Gyrase, Keratin
Lipids	Long Term Energy Storage, Insulation, Padding	Glycerol, fatty acids	Oils, fats, steroids, waxes
Nucleic Acids	Store Genetic Information, Energy Source	Nucleotide	DNA, RNA, ATP

Specific Molecule	Specific Function(s)
Glucose	Simple sugar; energy is converted into ATP energy; monomer of starch, cellulose and glycogen
Starch	Long term glucose storage in plants
Glycogen	Long term glucose storage in animals
Cellulose	Makes up cell walls in plants
Enzymes	Biological Catalysts; help speed up chemical reactions by lowering activation energy
Insulin	Lowers blood sugar by causing liver cells to take up glucose and convert them into glycogen
Hemoglobin	Carries oxygen in the blood
DNA	Long term storage of genetic information; passed from generation to generation
mRNA	Transmits DNA code from the nucleus to the cytoplasm where it is read by the ribosome

What are some of the functions of the proteins and other molecules found in the cell membrane?

Some proteins on the surface are used for detecting materials, channel proteins let certain substances pass through. Cholesterol causes the cell membrane to be more fluid.

What is the function of hormones?

They are slow acting chemical messengers that control growth, development and responses to the environment.

How do hormones travel throughout a body?

Circulatory system (blood stream)