Molecular Biology

Importance of carbohydrates, lipids and proteins in biology. Biochemistry.

Most common elements: Hydrogen., Carbon, Oxygen and Nitrogen

Carbon

- Long chains
- Ring structures
- Basic skeletons of organic molecules
- All organic molecules contain carbon

Polymers and macromolecules

- Polysaccharides
- Polypeptides (proteins)
- Polynucleotides (nucleic acids)

Poly means many

Polymers are macromolecules made up of many repeated subunits that are similar or identical to each other and are joined end to end.

The process of creating a polymer is called polymerisation.

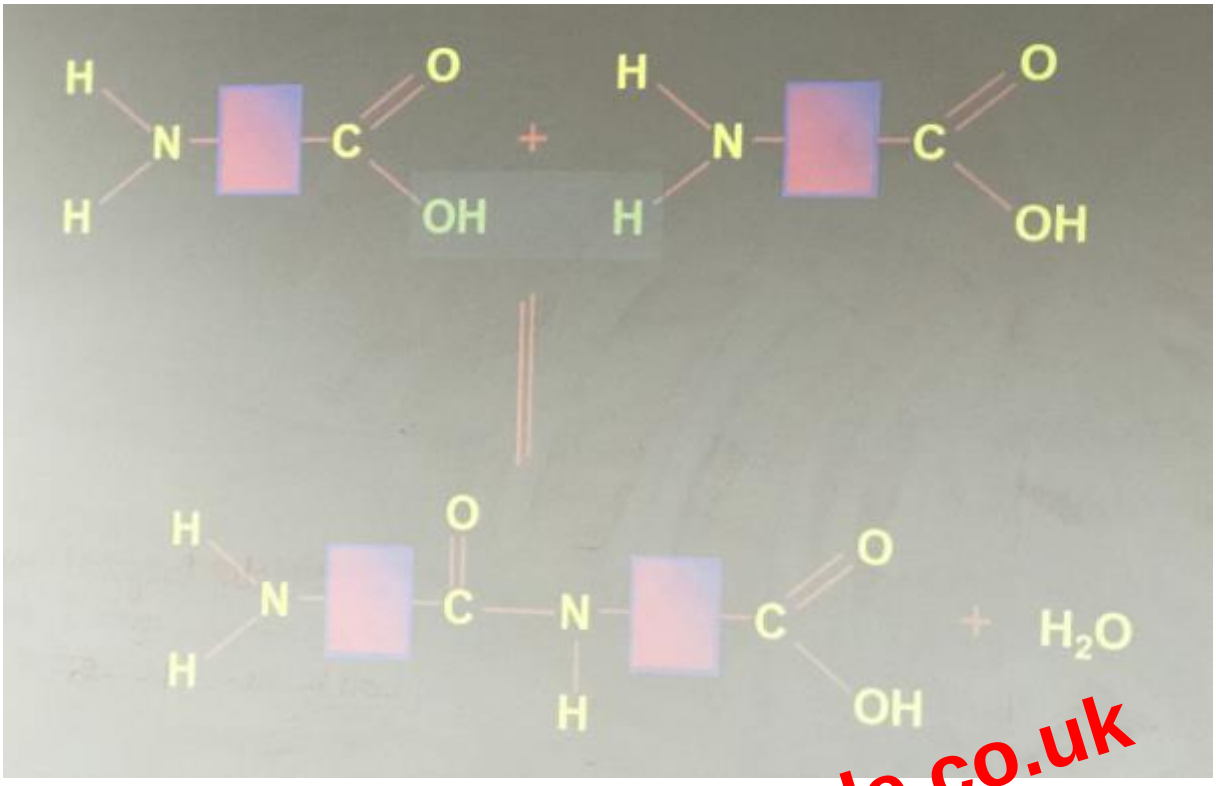
Examples of polymers

- Cellulose
- Rubber
- Many industrial polymers e.g.:
    - Polyester
    - Polythene
    - PVC
    - Nylon
- All made of carbon-based subunits

Carbohydrates – Monosaccharides

Contain Hydrogen, carbon and oxygen.

How do amino acids join to form the polymer?



Dipeptide

Proteins

Protein structure and functions

Primary structure (1°) is the sequence of amino acids in the polypeptide chain

Secondary structure (2°) consist of two types, alpha helix and beta pleat. They are held together by H-bonds.

Tertiary structure (3°) is a folding of primary and secondary structures due to attractions between side groups in primary structure. Therefore, the primary structure determines the folding of the protein into tertiary structures.

Quaternary structure (4°) is a combination of two or more polypeptide chains and is the prosthetic group, the non-protein group, which provides functionality, for example haemoglobin, which has four subunits, each with a haem group meaning it carries oxygen.

* image from Google Images