

Course Structure

- Total of 10 lessons of Biology per fortnight.
- Two teachers (Miss Foster, Mr Meads, Ms Nayyar and Mrs Makwana)
- 5 lessons per fortnight with each teacher.
- Plus assessment period 1 per fortnight.
- 12 assessed practical's over two years.
- Terminal exams at end of year 13
- 3 papers: 2x 2 hour 15 mins and 1 x 1 hour 30 mins.

Key elements

- **99% of living things are made up of 4 elements.**
- **What 4 elements do you think they are?**

C O H N

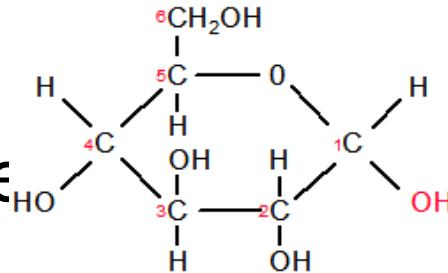
Biological Molecules

- What biological molecules are made from these elements?
- H & O Water
- C, H & O Carbohydrates
- C, H & O Lipids
- C, H, O & N Proteins and Nucleic acid

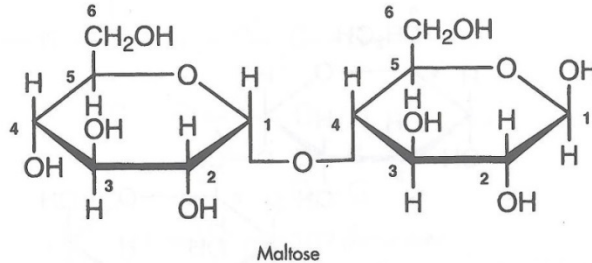
Biological Molecules	Monomers	Polymers
Carbohydrates	Monosaccharides	Polysaccharides
Proteins	Amino acids	Polypeptides
Nucleic acid	Nucleotides	Polynucleotides

Carbohydrate

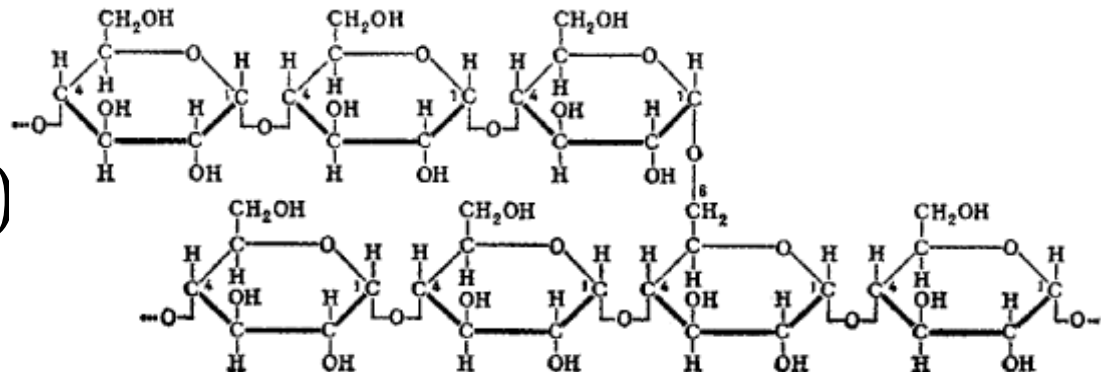
- Monomer
(Monosaccharide)



- Dimer
(Disaccharide)



- Polymer
(Polysaccharide)



Monosaccharides

- Hexose (6C) e.g. Glucose, Fructose, Galactose.
- Pentose (5C) e.g. Ribose, Deoxyribose.
- Trioses (3C) e.g. Glyceraldehyde

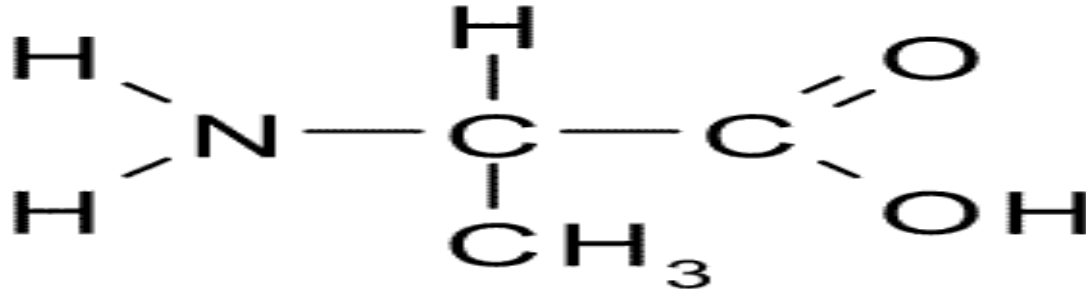
Disaccharides

- Sucrose = Glucose + Fructose
- Maltose = Glucose + Glucose
- Lactose = Glucose + Galactose

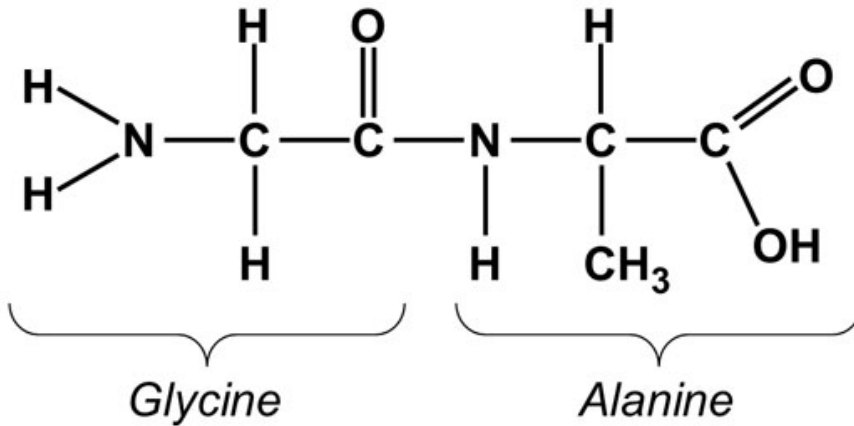
Testing for Carbohydrates

Substance	Test	Procedure	Colour change
Starch	Iodine	Add iodine to substance	Yellow to blue-black
Reducing sugar	Benedict's solution	Mix 4cm ³ substance with 2cm ³ benedict's solution and gently heat.	Blue to brick red
Non reducing sugar	Hydrochloric acid and Benedict's solution	Mix 4cm ³ substance with 2cm ³ hydrochloric acid and gently heat for 2 mins. Remove and allow to cool. Add sodium hydrogen carbonate until it stop fizzing. Check the pH is neutral. Mix 4cm ³ substance with 2cm ³ benedict's solution and gently heat.	Blue to brick red

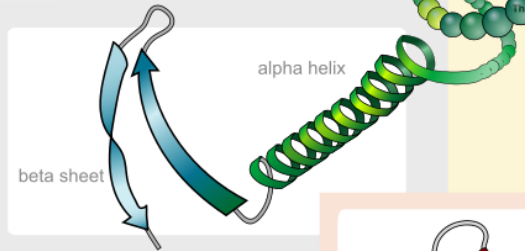
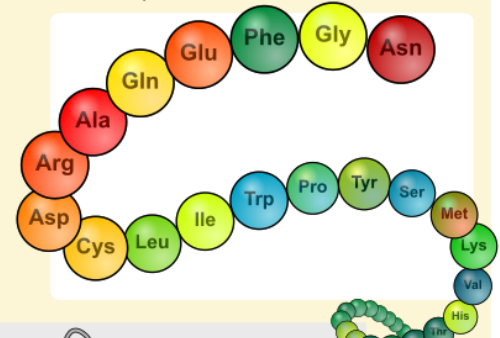
Protein



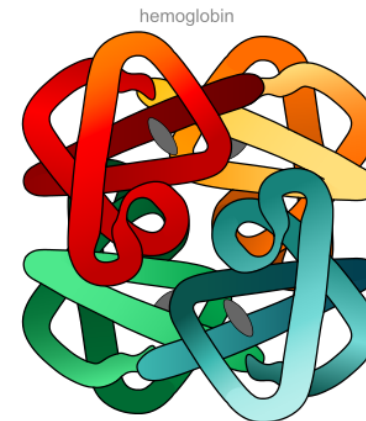
A dipeptide



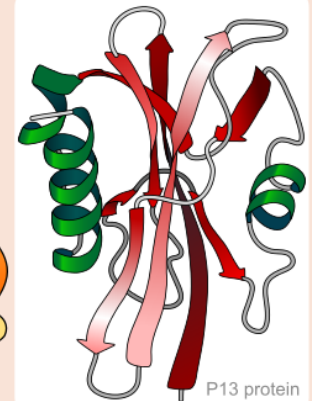
Primary structure
amino acid sequence



Secondary structure
regular sub-structures



Quaternary structure
complex of protein molecules



Tertiary structure
three-dimensional structure

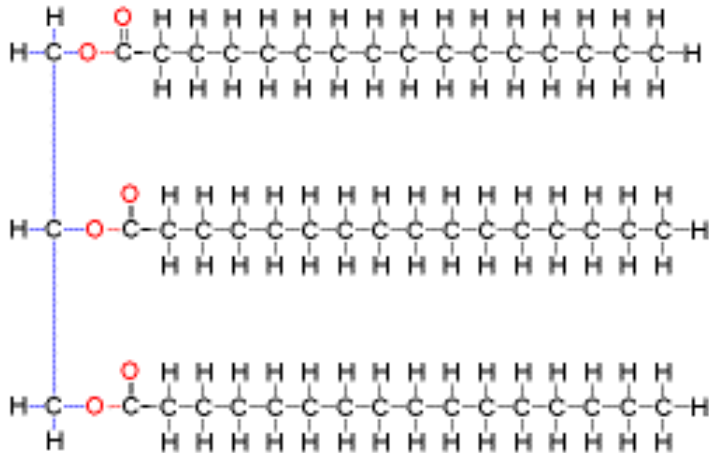
Testing for proteins

Substance	Test	Procedure	Colour change
Protein	Biuret	Equal volumes of substance and sodium hydroxide are shaken to mix and then a small amount of copper sulphate solution added drop at a time and shaken in between.	Blue to lilac

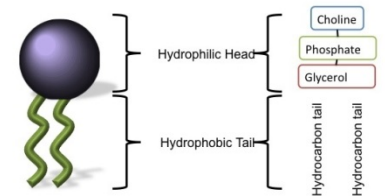
Lipids

Lipids are not polymers they are in fact macromolecules.

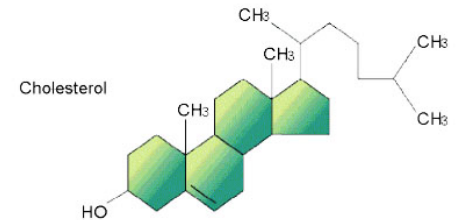
Triglycerides (fats and oils)



Phospholipid



Steroids



Testing for lipids

Substance	Test	Procedure	Colour change
Lipids	Emulsion	Mix substance with ethanol. Then add water and shake.	Turns milky

Testing Urine

- We are now going to test urine for two biological molecules.
 - Reducing sugar, such as glucose.
 - Protein.
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- Whilst testing the urine have a discussion with your partner about what type of diseases might give a positive reading in these tests.

Substance	Test	Procedure	Colour change
Reducing sugar	Benedict's solution	Mix 4cm ³ substance with 2cm ³ benedict's solution and gently heat.	Blue to brick red
Protein	Biuret	Equal volumes of substance and sodium hydroxide are shaken to mix and then a small amount of copper sulphate solution added drop at a time and shaken in between.	Blue to lilac

Substance	Reducing sugar	Protein
A		
B		
C		