



#VictoryScientist

Welcome to A Level Biology!

AQA AS Biology (7401)

A-level Biology (7402)

There are 4 units in A Level Biology Year 1.

1. Biological molecules
2. Cells
3. How organisms exchange substances with their environment
4. Genetic information, variation and relationships between organisms

Plus you will carry out and learn six required practicals



There are 4 units in A Level Biology Year 2.

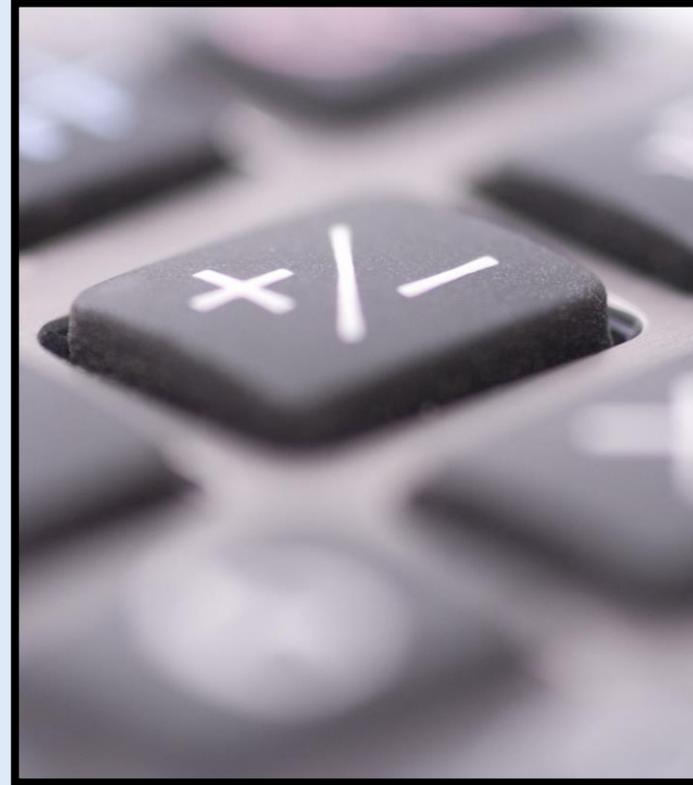
5. Energy transfers in and between organisms
6. Organisms respond to changes in their internal and external environment.
7. Genetics, populations, evolution and ecosystems
8. The control of gene expression

Plus six additional required practicals



At least 10% of the marks in assessments for biology will require the use of mathematical skills.

These will be at least at the level of the **GCSE Higher** paper and will be practiced in class and assessed in the examination questions.



At least 15% of the marks in assessments for biology will require the use of practical skills.

Practical skills will be assessed by examination. However, you will be awarded in addition to this a pass or fail grade based on the following competencies:

1. Following written procedures
2. Applying investigative approaches and methods when using instruments and equipment
3. Safely using a range of practical equipment and materials
4. Making and recording observations
5. Researching, referencing and writing reports



Introduction to Biological Molecules 13/08/2025

Learning objectives

- Describe what a mole is, and what is meant by a molar solution.
- Explain bonding and the formation of molecules.
- Describe polymerisation and state what macromolecules are.
- Describe condensation and hydrolysis.
- Describe metabolism.

Specification reference: 3.1.1

Welcome to your AQA A Level Biology transition lesson...

Starter:

What is meant by a biological molecule?

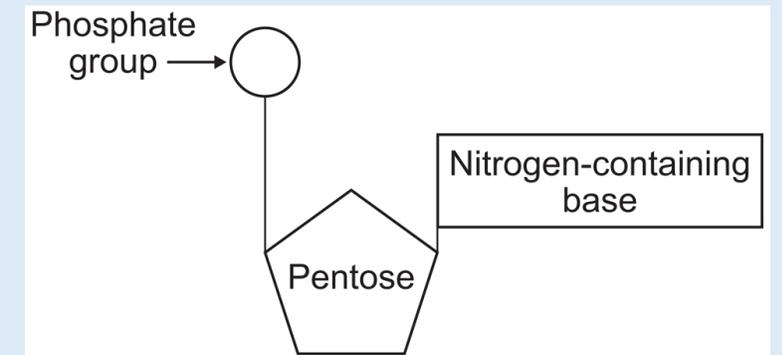
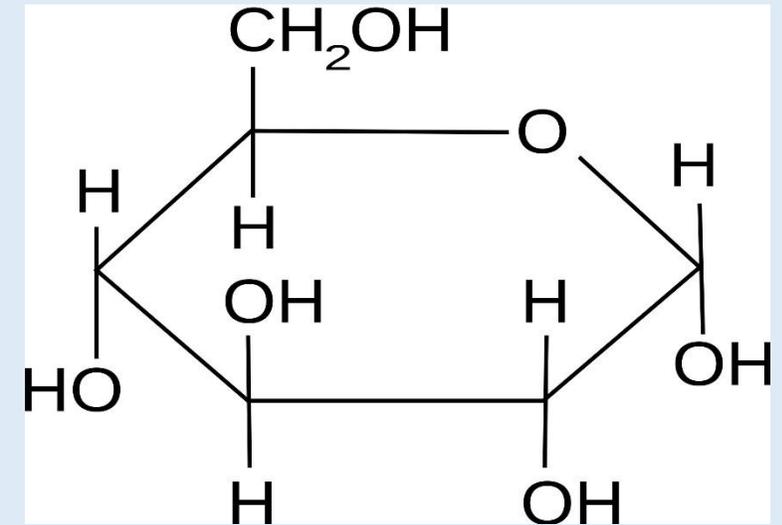
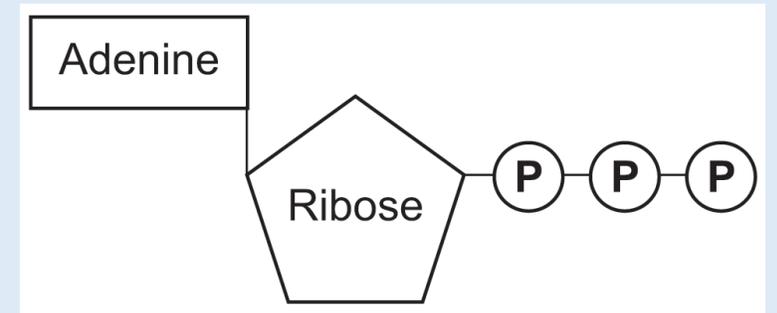
Can you name any molecules that are important in cells?

What are biological molecules?

- Particular groups of chemicals found in living organisms

Examples of biological molecules:

- Carbohydrates - simple sugars, starch, cellulose, glycogen
- Lipids - fat, oils, phospholipids
- Proteins (such as enzymes)
- Nucleic acids (which form DNA and RNA)
- Water
- ATP



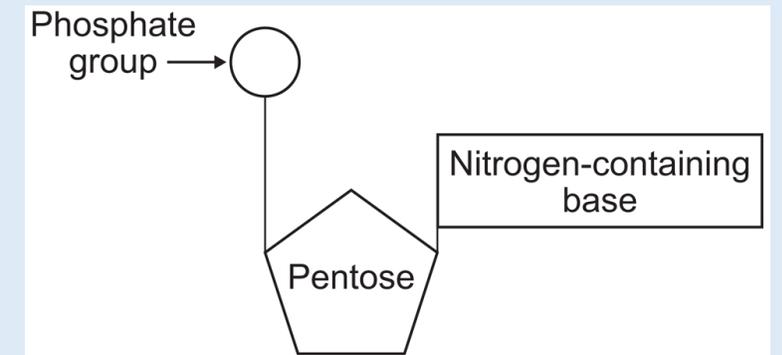
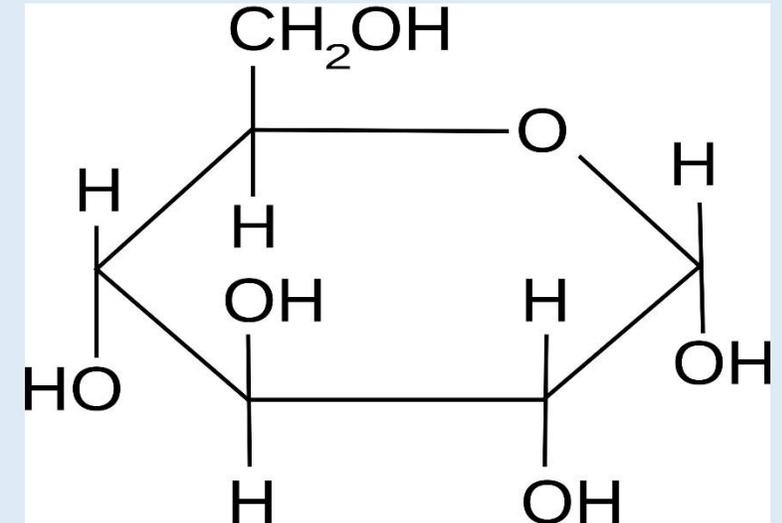
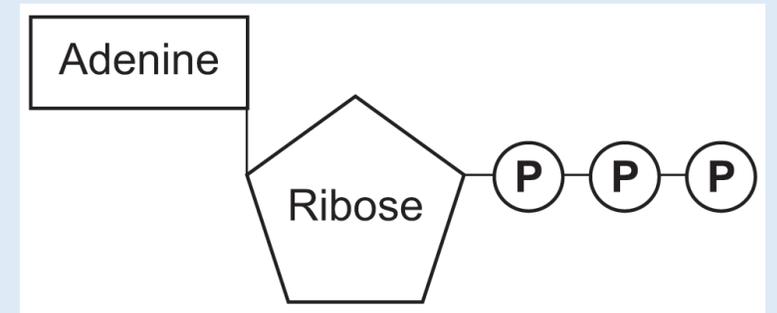
What are biological molecules?

Questions:

Name 3 biological molecules.

What elements make up carbohydrates?

What is the monomer of proteins?

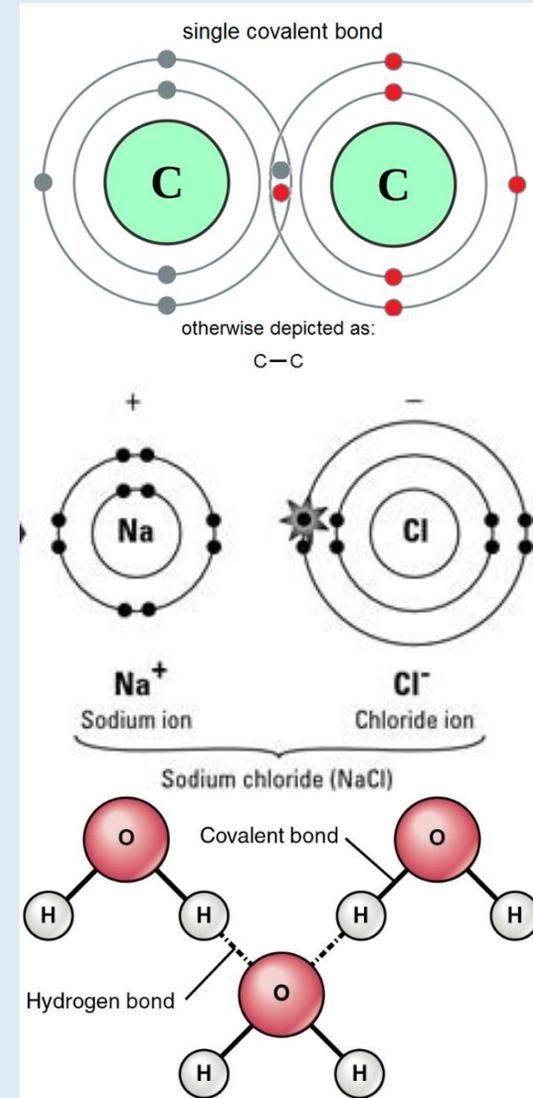


What bonds are needed to make molecules?

Covalent bonds - non-metal atoms share a pair of electrons from their outer shells to form a more stable compound molecule

Ionic bonds - metal and non-metal atoms form ions with opposite electrostatic charges which are attracted to each other

Hydrogen bonds - polar molecules, where electrons do not sit evenly between two molecules, mean that one end of the molecules is slightly negative while the other is slightly positive. This leads to weak electrostatic attractions between different molecules.



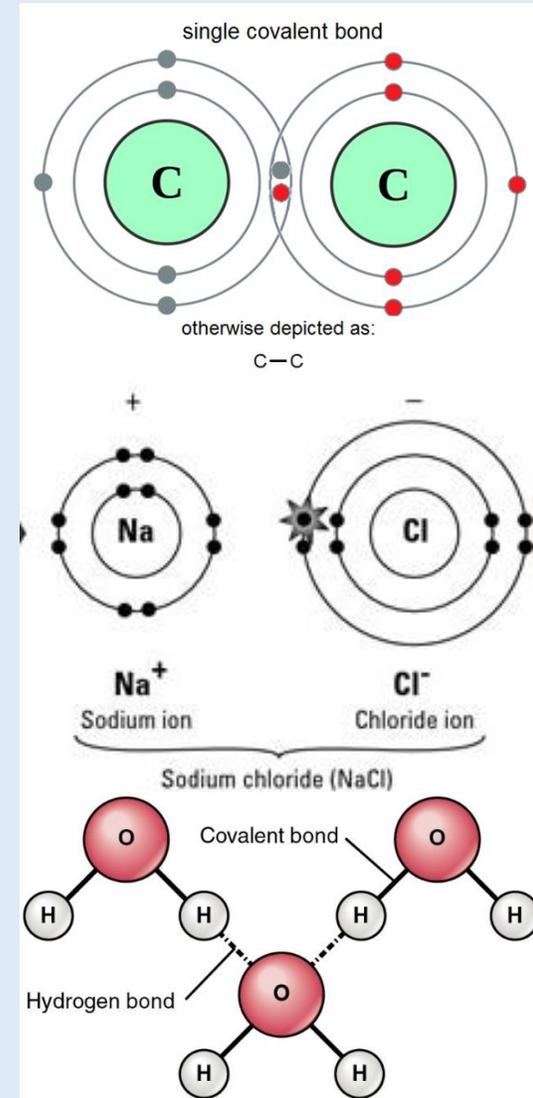
What bonds are needed to make molecules?

Questions:

What atoms form a covalent bond?

Draw a diagram to show an ionic bond between Li and Cl.

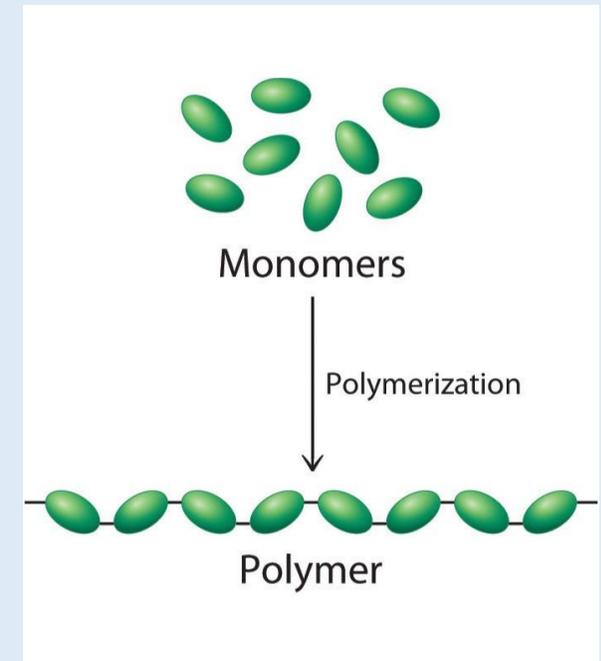
Why does water have such a high specific heat capacity?



Monomers and Polymers

- Monomers are single molecules that can be joined together to form polymers
- Mono = one, di = two, poly = many

Carbohydrate	Example Molecules
Monosaccharide	Glucose, Fructose and Ribose
Disaccharide	Lactose and Sucrose
Polysaccharide	Glycogen, Cellulose and Starch

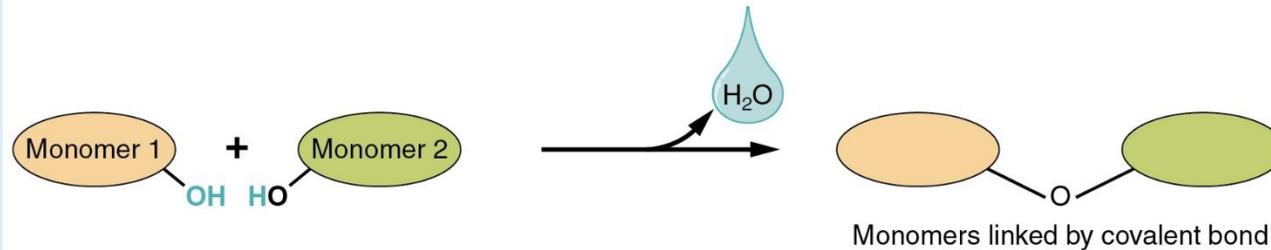


Condensation and Hydrolysis reactions

- Condensation - two molecules combine, water is lost
- Hydrolysis - water is used to split two molecules apart

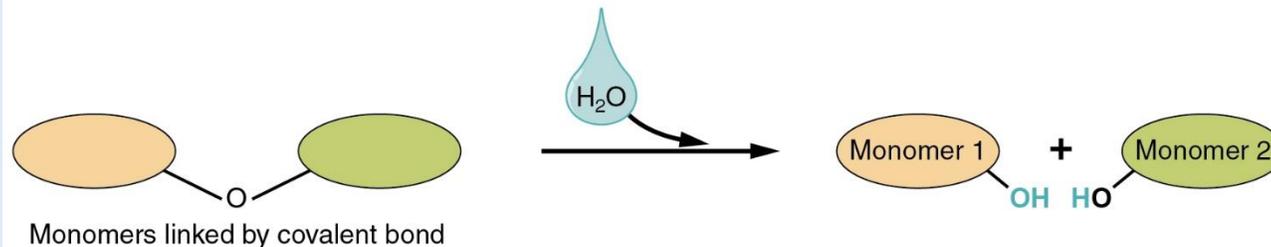
(a) Dehydration synthesis

Monomers are joined by removal of OH from one monomer and removal of H from the other at the site of bond formation.



(b) Hydrolysis

Monomers are released by the addition of a water molecule, adding OH to one monomer and H to the other.

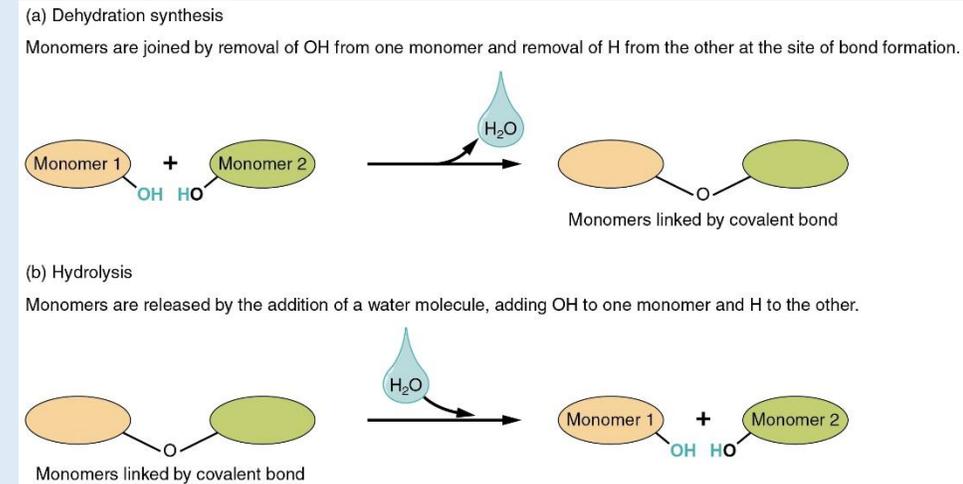


Condensation and Hydrolysis reactions

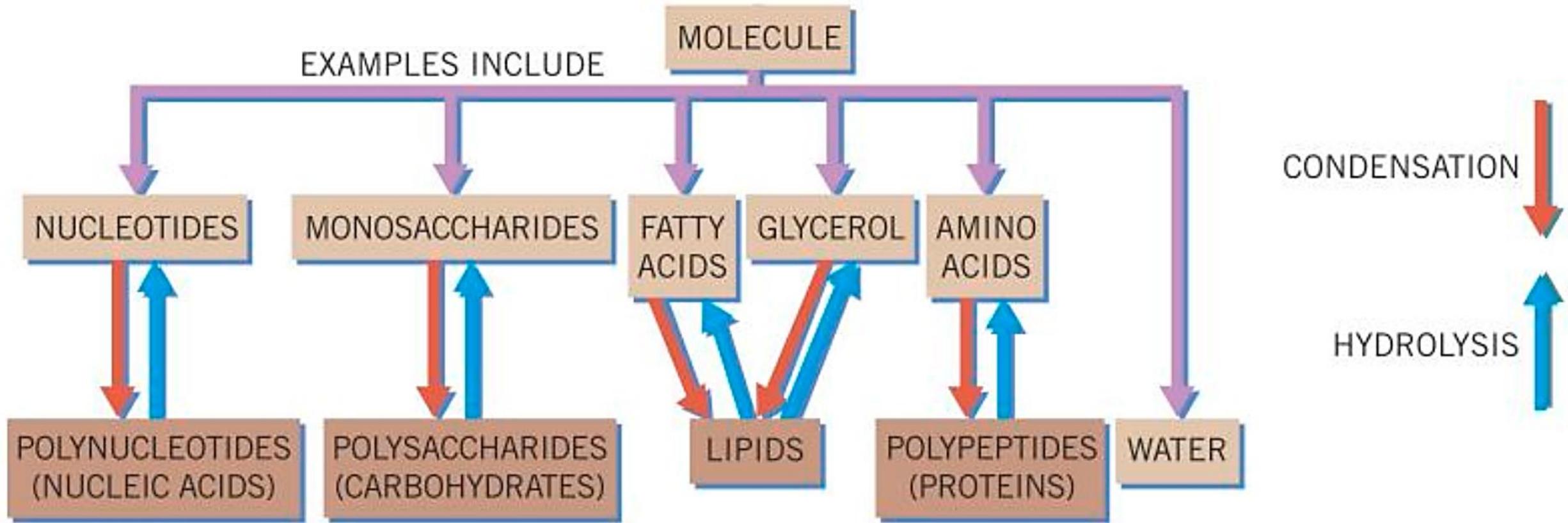
Questions:

Name 2 disaccharides.

What molecule forms in a condensation reaction?



Summary:



▲ **Figure 1** Summary of atomic and molecular organisation

Collect a copy



#VictoryScientist



GCSE to A-level progression: Student transition activities – Biology

Student booklet with information about:

- the specification and structure of the assessment
- and key skills activities to support the move from GCSE to A-level Biology.