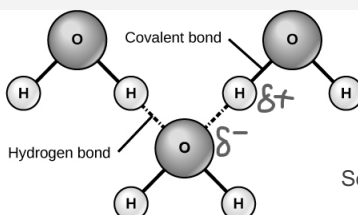
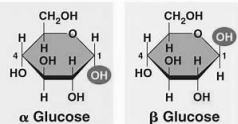


Key Terms		Inorganic Ions (cont)		Water Structure		Glucose	
Conden-sation	The removal of a water molecule to form a bond between 2 molecules.	Calcium	Structural component of bones and teeth (phosphate is also required).	It is a dipolar molecule - Has a positively charged hydrogen end and a negatively charged oxygen end but no overall charge .		Glucose is a hexose sugar.	
Hydrolysis	The chemical addition of a water molecule to break a bond between 2 molecules.	Phosphate	Needed for making nucleotides including ATP . A constituent part of phospholipids in cell membranes.	Hydrogen bonds easily form between the hydrogen on one molecule and the oxygen on another.		Other hexose sugars include galactose and fructose .	
Ion	A charged atom or molecule that has gained or lost electrons.			Individually water molecules are weak however together they are strong .		Isomers are substances that have the same formula but different structures.	
Isomer	Molecules with the same chemical formula , but with a different arrang-ement of atoms			The majority of water's properties arise from its dipolar nature and hydrogen bonding .		The isomers of glucose are a-glucose and b-glucose .	
Structures		Carbohydrates		Water Molecule		Alpha and Beta Glucose	
Should be able to recognise the structural formulae of the main biological molecules and show how bonds are formed . See pg.8		Structure: Small organic molecules containing carbon , oxygen and hydrogen .					
		Function: Building blocks for more complex molecules, e.g. ribose, which forms a constituent molecule of RNA Source of energy , e.g. glucose Energy storage molecules, e.g. glycogen and starch Structural support , e.g. cellulose and chitin				Properties Solvent Involved in many biological reactions , e.g. hydrolysis and condensation - Allows polar molecules e.g. glucose and ions , to dissolve . It a transport medium e.g. blood .	
Inorganic Ions		Key terms		Monosaccharides			
Magnesium	Constituent of chlorophyll -> needed for photosynthesis . When lacking, leaves appear yellow (chlorosis).	Dipolar	A polar molecule with a positive and negative charge.	All contain carbon , hydrogen and oxygen (CH2O)n where n is a number between 3 and 6.			
Iron	Constituent of haemoglobin , so is involved in transport of oxygen . A diet deficient in iron can lead to anaemia .	Hydrogen bond	Weak attractive force between a positively charged hydrogen atom and a negatively charged oxygen or nitrogen atom.	The triose sugars are important in respiration pathways . Pentose sugars such as ribose and deoxyribose are important constituents of nucleic acid and deoxyribonucleic acid (DNA)			

Water Properties (cont)

High specific heat capacity

Large amount of **heat energy** needed to **increase** the temp of a **body of water** (due to large number of hydrogen bonds that need to be broken) large **fluctuations** in temperature are **prevented**. **Aquatic environments** are therefore relatively **thermally stable**.

High latent heat of vaporisation

Large amounts of **heat energy** are needed to **vaporise water**, so it is often used as a **cooling mechanism** e.g. sweating in mammals.

Metabolite

It is involved in many **biochemical reactions**, e.g. hydrolysis and condensation and as a reactant in photosynthesis.

Water Properties (cont)

Cohesion

Water molecules **attract each other** and form **hydrogen bonds** between themselves. This allows **water** to be drawn up the **xylem** vessels of trees, and creates **surface tension** allowing insects such as the **pond skater** to be supported. Water also **provides support** for other aquatic organisms e.g. **jellyfish**

High density

Water has a **maximum density** at **4degreesC**: as a result, **ice floats**, and acts as an **insulator** preventing the water beneath from **freezing completely**, protecting the aquatic habitat.

Water Properties (cont)

Trans parent

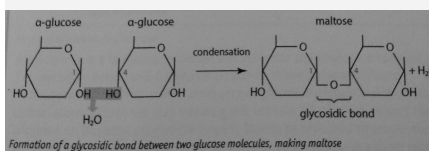
Allows **light** to pass through **enabling** aquatic plants to **photosynthesise**.

Disaccharides

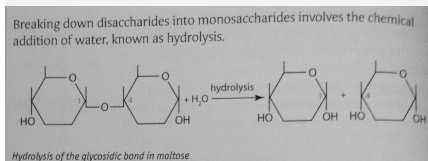
Formed by **joining 2 monosaccharides** together

Involves the **loss** of a molecule of **water** and the **formation** of a **glycosidic bond**, via a **condensation reaction**

Formation of Maltose



Hydrolysis of Maltose



Types of Disaccharide

Disaccharide	Component Monosaccharides	Biological Role
Maltose	Glucose + glucose	In germinating seeds
Sucrose	Glucose + fructose	Transport in phloem flowing plants
Lactose	Glucose + galactose	In mammalian milk

Polysaccharides

Formed when many monosaccharides **combine together** to make a **polymer**

They are good **energy storage molecules** because:

-Unable to **diffuse** out of the cell