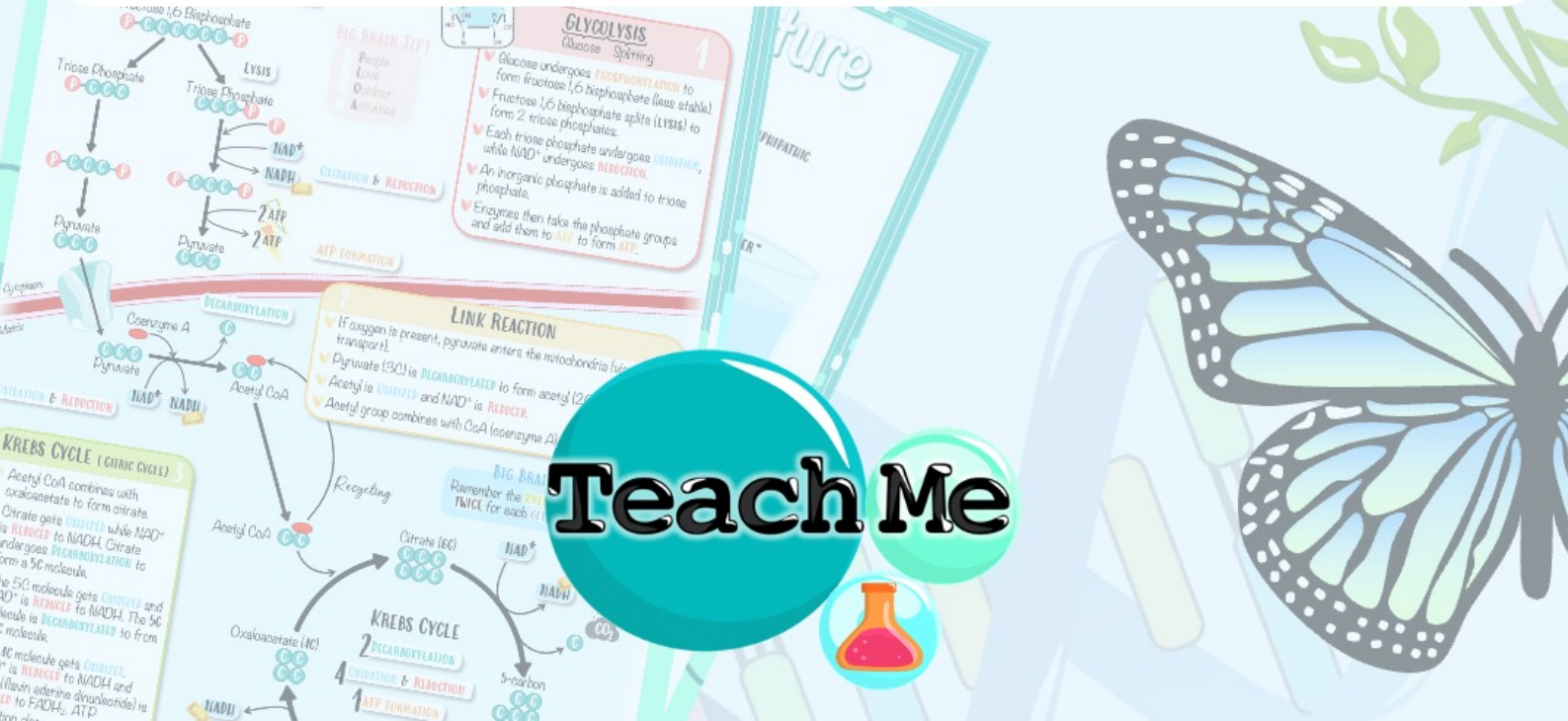
TeachMe

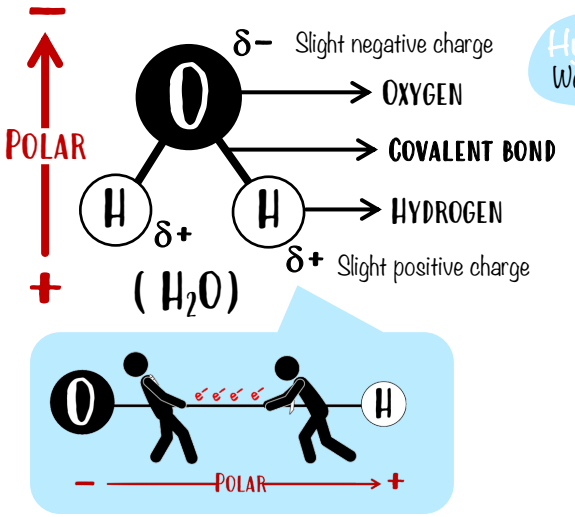
STUDY NOTES

A1.1 WATER

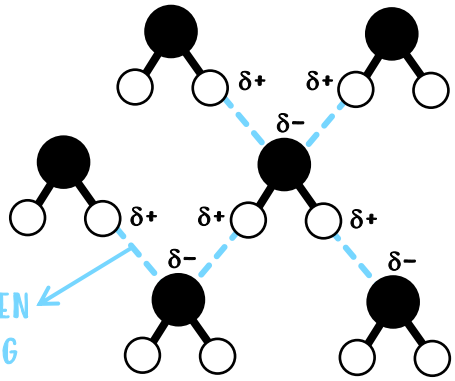
Last update: 2024.04.07



Water



TIP!
Hydrogen bonds are hydrating.
Weaker than covalent bonds.



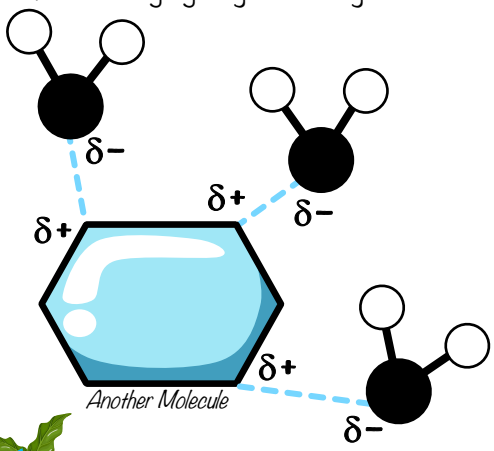
Ephemeral (temporary) attraction between water molecules
(negative charge attracts positive charge)

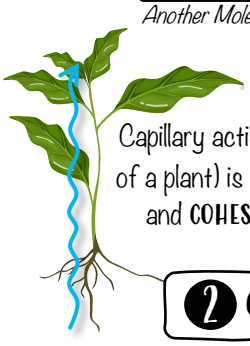
PROPERTIES OF WATER

1 ADHESION 2 COHESION 3 SOLVENT 4 PHYSICAL

1 ADHESION

Unlike molecules are attracted to each other by hydrogen bonding

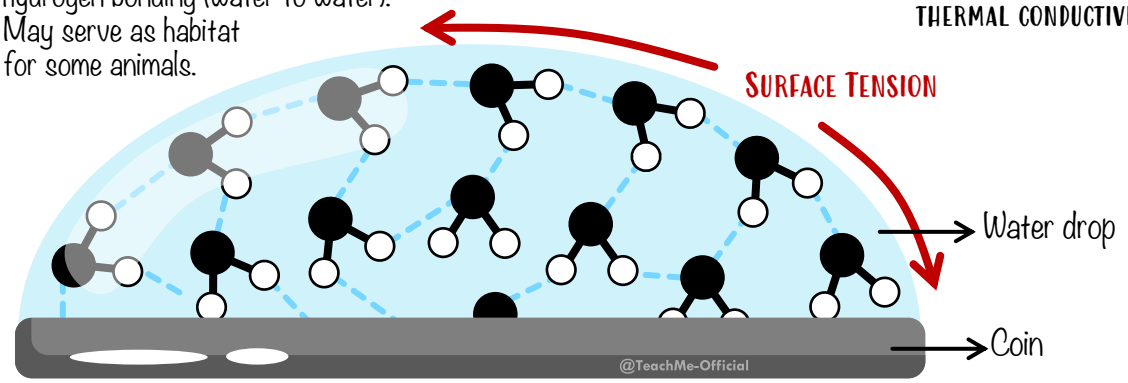




Capillary action (water climbing up xylem of a plant) is due to **BOTH** the **ADHESION** and **COHESION** properties of water!

2 COHESION

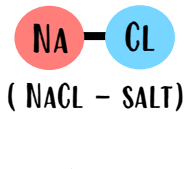
Molecules of the same type are attracted to each other by hydrogen bonding (water to water).
May serve as habitat for some animals.



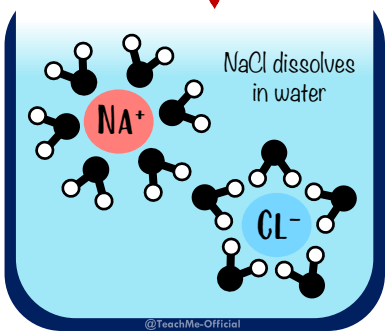
3 SOLVENT

Capability of a substance to dissolve another substance creating a solution

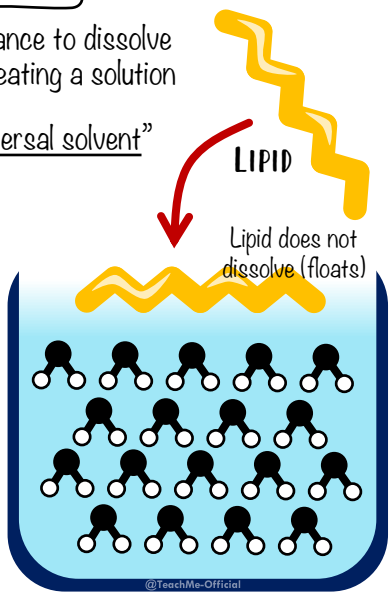
Water is the "universal solvent"



(NACL – SALT)



HYDROPHILIC
Water Loving
(Amino acids, NaCl, Glucose (sugars))



HYDROPHOBIC
Water Fear
(Lipids, Proteins, CO_2, O_2, Cholesterol)

4 PHYSICAL

Includes **BUOYANCY**, **VISCOSITY**, **SPECIFIC HEAT** and **THERMAL CONDUCTIVITY** properties of water

See page 2

Water

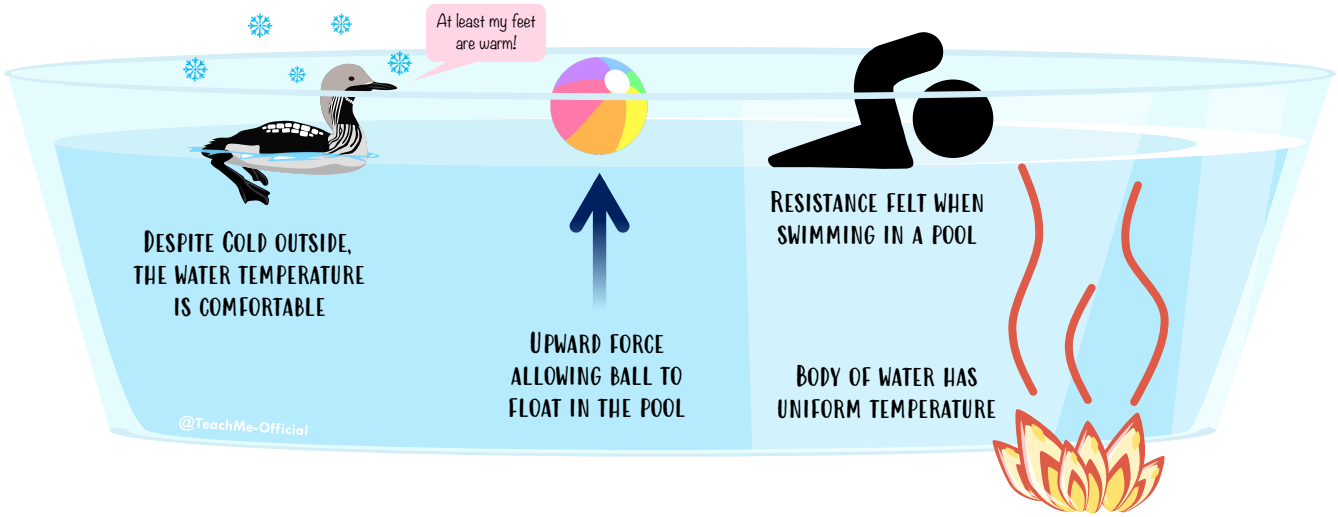
4 Physical

A Buoyancy

An upwards force exerted on an object placed on a specific medium (E.g. Water).

B Viscosity

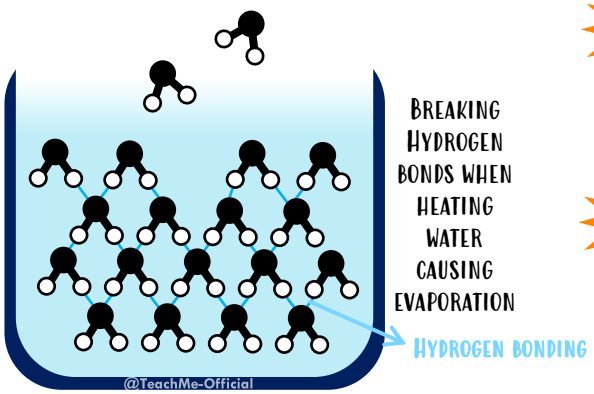
The resistance of a substance gives (E.g. water) to an object moving through it.



C Specific Heat

The amount of heat input it takes to change the temperature of a substance (E.g. Water).

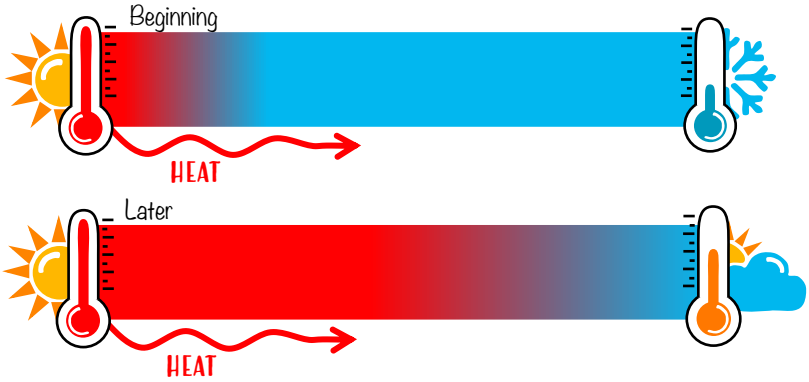
Water has **HIGH** specific heat
(temperature doesn't change so easily)



D Thermal Conductivity

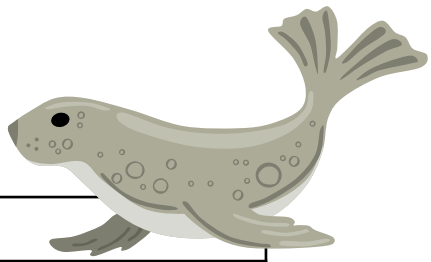
The ability of a substance (E.g. water) to transfer heat.

Water has **HIGH** conductivity
(heat is transferred easily in water)



Physical Properties of Water in Nature

Black Throated Loon



Ringed Seal

Black Throated Loon		Ringed Seal
Helps it float	**Buoyancy**	Helps it float
Requires energy to overcome the viscosity of the water. E.g., webbed feet and streamlined body shape.	**Viscosity**	Requires energy to overcome the viscosity of the water. E.g., paddle feet and streamlined body shape.
Arctic water is warmer than arctic air	**Specific Heat**	Arctic water is warmer than arctic air
Need to minimize heat loss. Oil gland near tail, using beak to rub the oil on the feather making them waterproof.	**Thermal Conductivity**	Need to minimize heat loss. Thick blubber under the skin (provides insulation).

notes