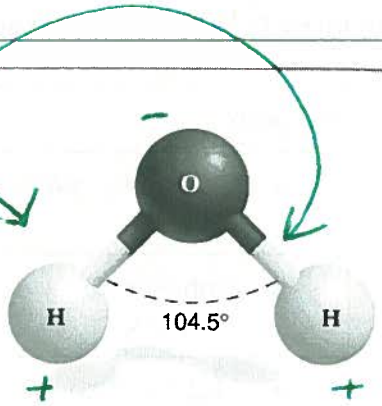
**Guided Notes - Properties of Water, Acids, Bases, & pH**

Water is a molecule formed by Covalent bonds.

The Hydrogens and Oxygen atom share their electrons.

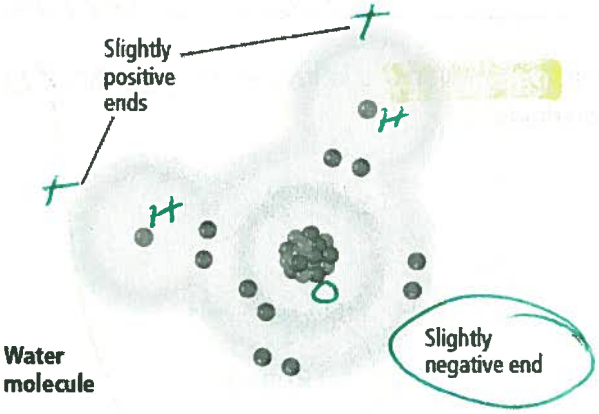
Oxygen is a very electronegative atom, it does NOT sharing the electrons equally with the two hydrogen atoms.




The unequal sharing of electrons results in charged ends of the molecule.

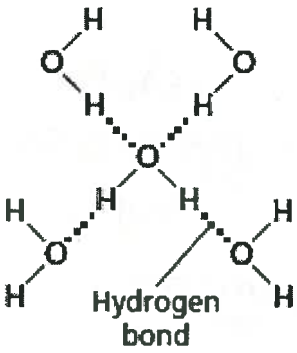
Polar molecules result when atoms do not share their electrons equally.

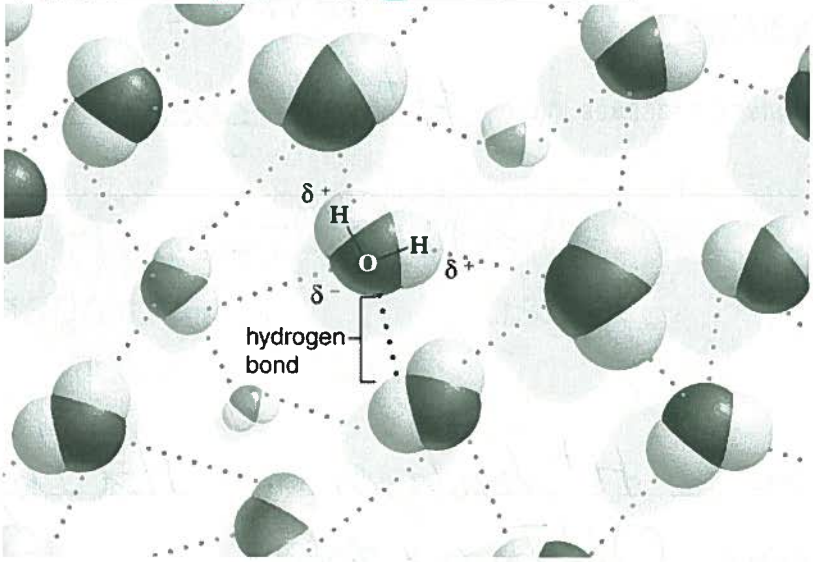
Water is a polar molecule




Water molecules attract to one another and form hydrogen bonds.

Hydrogen bonding is also known as van der Waals Forces.



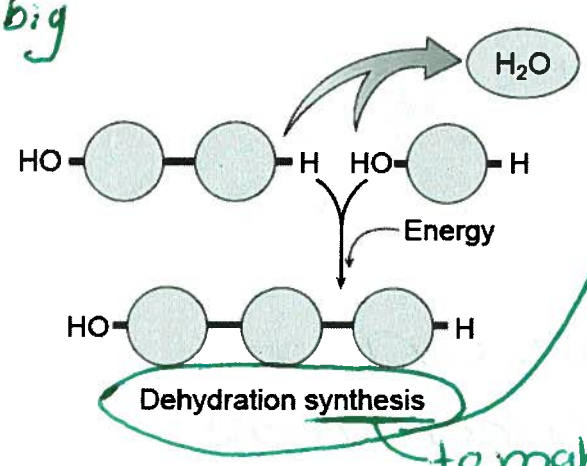



Properties of Water https://www.youtube.com/watch?v=aVmU3CLxvgU

| Property | Example |
|---|---|
| • Universal Solvent | Dissolves & breaks down Solute (NaCl(salt), Sugar) $NaCl \rightarrow Na^+ + Cl^-$ |
| • Cohesive & Adhesive | Co = water sticks to other water molecules<br>Ad = Water can stick to other polar molecules |
| • High Surface Tension | Greater attraction of water molecules @surface e.g. insects walk on water |
| • High Heat Capacity | water resists temperature change |
| • Density | water is less dense as a solid* more dense as a liquid Ice Floats |

Water is important in metabolism. It is involved in making and breaking of chemical bonds in macromolecules.

big

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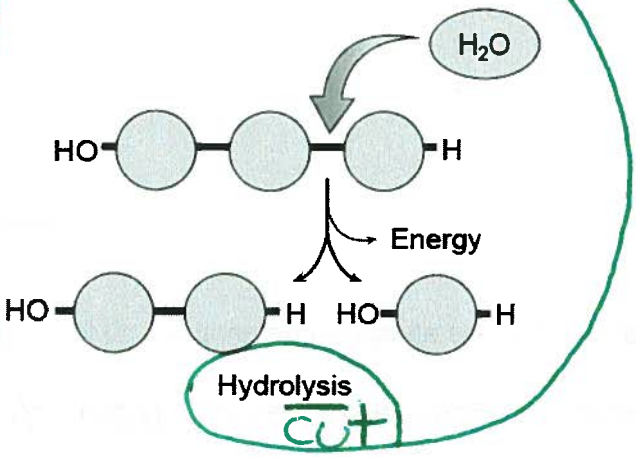
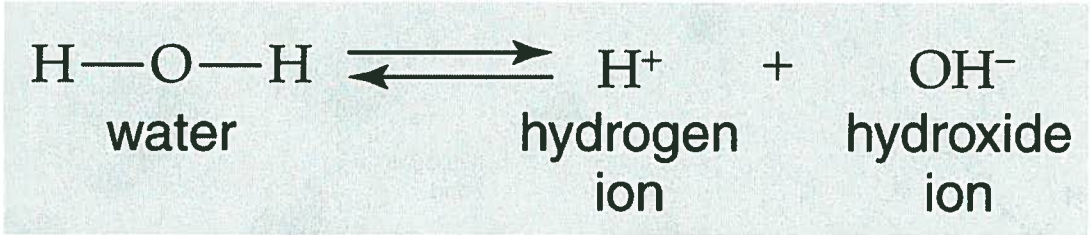


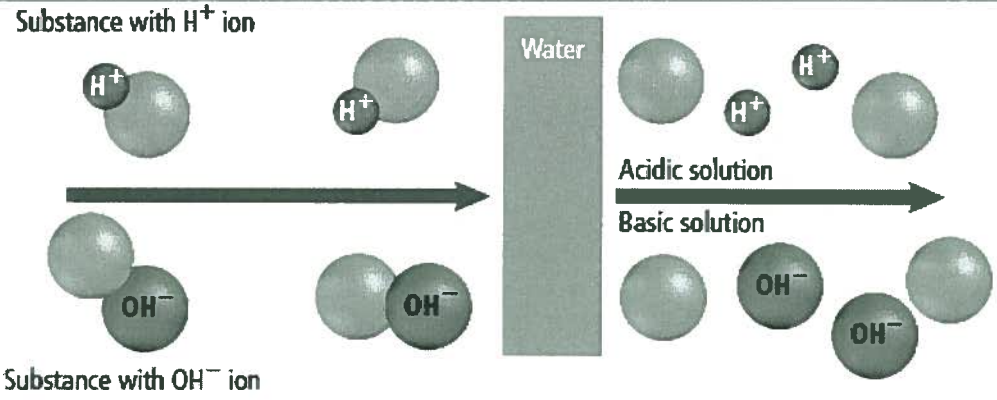

**ACIDS & BASES**

Water dissociates into a $H^+$ hydrogen and $OH^-$ Hydroxide ions.




Acids release $H^+$ hydrogen ions or $H_3O^+$ hydronium ions.

Bases release $OH^-$ hydroxides ions.




**pH**

The pH scale is used to measure the concentration of H+ hydrogen ions.

The greater the H+ concentration the more acidic..

Bases have a low concentration of H+ ions.

| [H+] (moles per liter) | | pH |
|---|---|---|
| 0.000001 | $= 1 \times 10^{-6}$ | 6 |
| 0.0000001 | $= 1 \times 10^{-7}$ | 7 |
| 0.00000001 | $= 1 \times 10^{-8}$ | 8 |

Acid ↑ neutral ↓ Base

**Identify examples from the diagram below.**

| Acids | | Bases | | Neutral |
|---|---|---|---|---|
| Urine | weak | Seawater | weak | Blood |
| Battery acid | strong | NaOH | strong | Pure Water |

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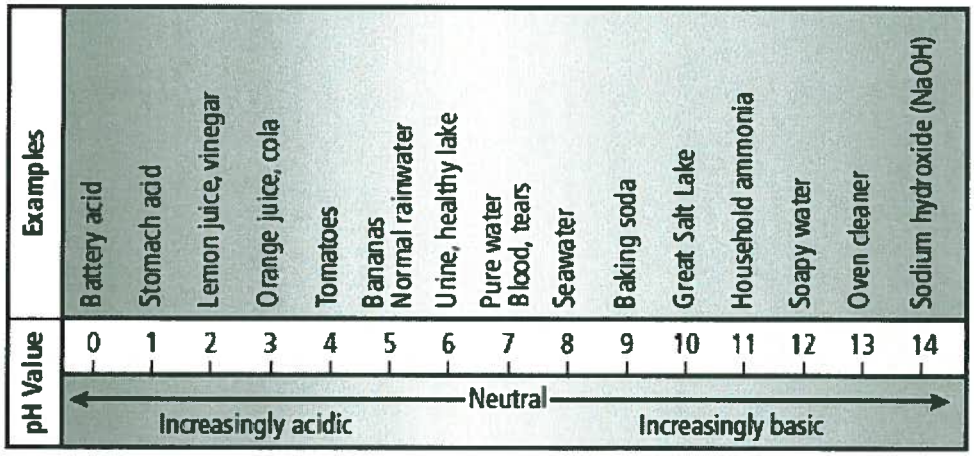


Buffers help neutralize acids and bases to maintain a certain pH.

Many organisms need buffers to maintain a certain pH allowing them to maintain homeostasis.