

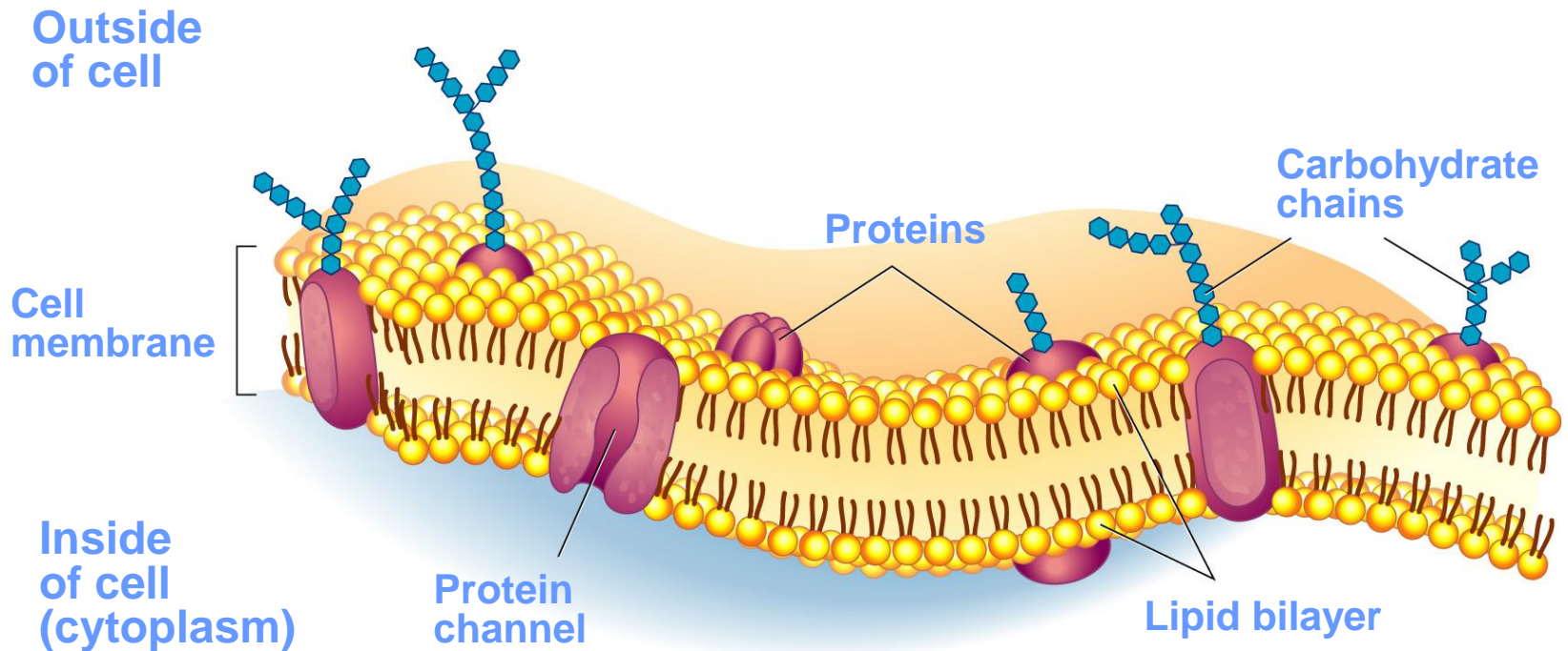


7-3 Cell Boundaries

Permeability & Transportation
of Molecules

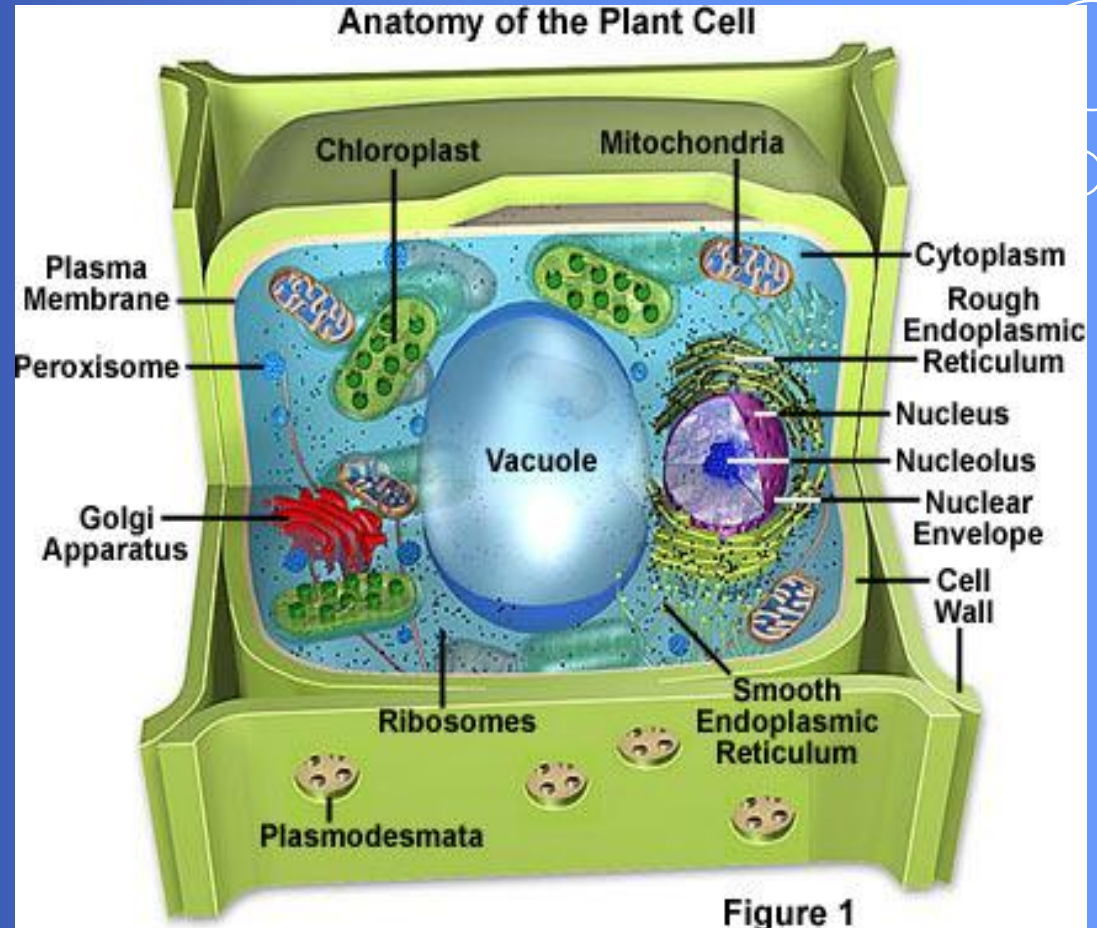
Cell Membrane

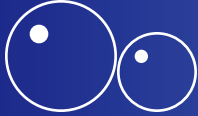
- All cells are surrounded by a cell membrane
 - Thin, flexible barrier
 - Regulates what enters and leaves the cell
 - Provides protection and support for the cell



Cell Walls

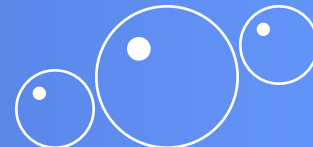
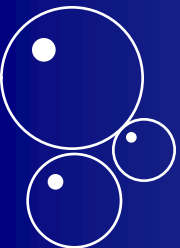
- Plant cells are surrounded by a cell wall
 - Tough layer outside the cell membrane
 - Gives support and protection for the cell






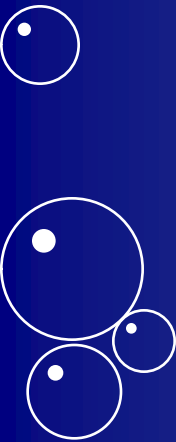

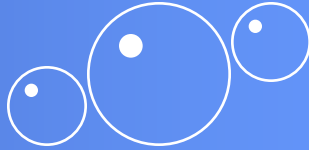
Key Vocabulary

- Solute
 - Substance that is dissolved in a solvent to make a solution
- Solvent
 - Substance in which a solute is dissolved to form a solution
- Solution
 - Mixture of two or more substances in which the molecules of the substances are evenly distributed



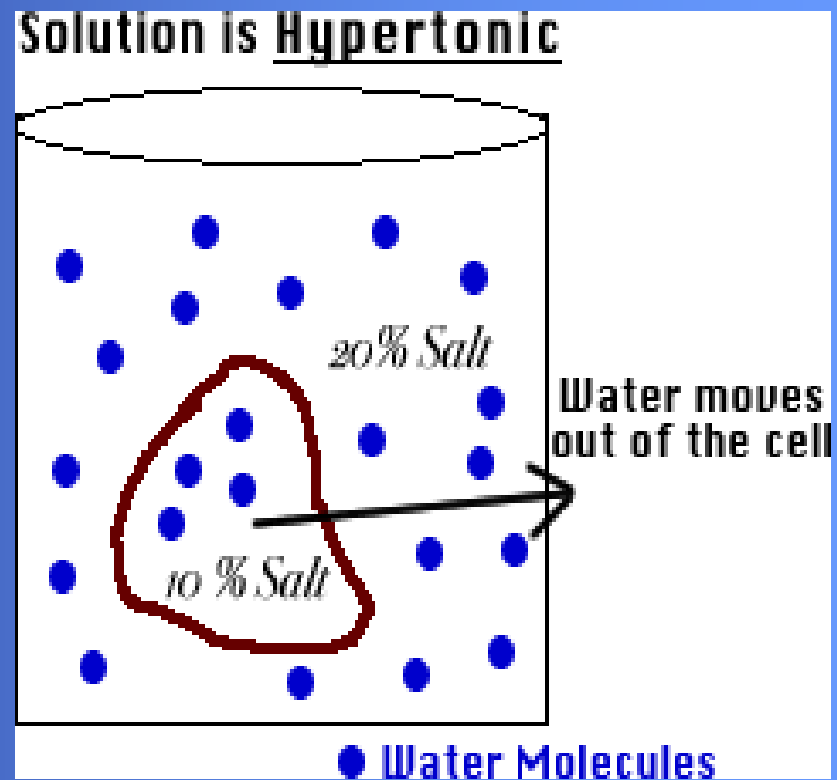


Concentration

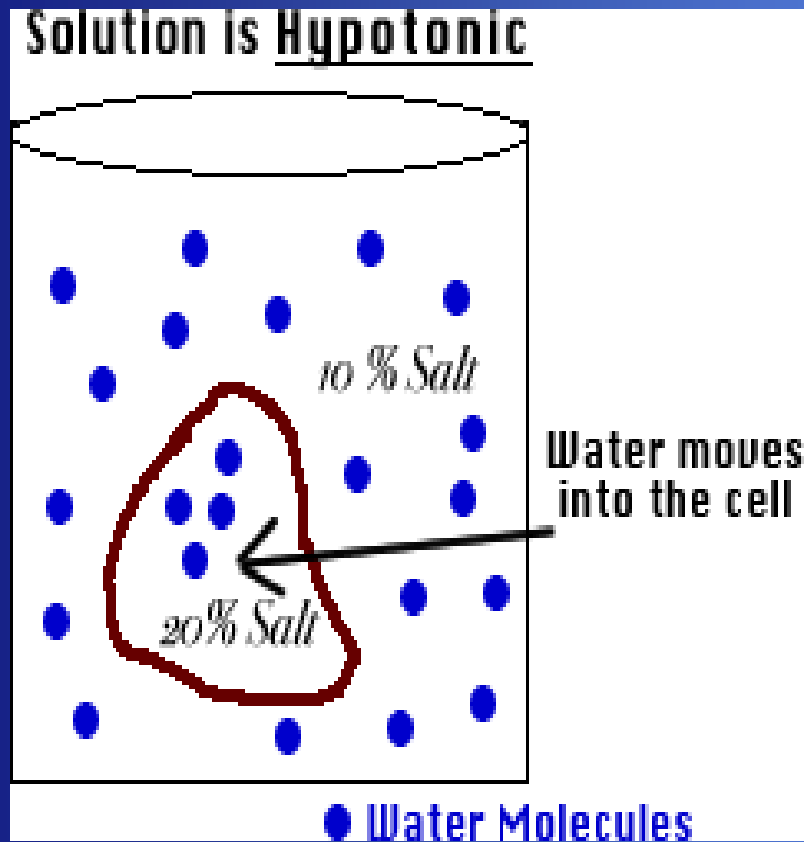
- The mass of a solute in a given volume of solution
 - Ex. If you dissolved 12 grams of salt in 3 liters of water, the concentration would be $12\text{g}/3\text{L}$ or $4\text{g}/\text{L}$. If you dissolved 12 grams of salt in 6 liters of water, the concentration would be $12\text{g}/6\text{L}$ or $2\text{g}/\text{L}$. The first solution is twice as concentrated as the second solution.
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Hypertonic

- Describes the side of the membrane with the higher concentration

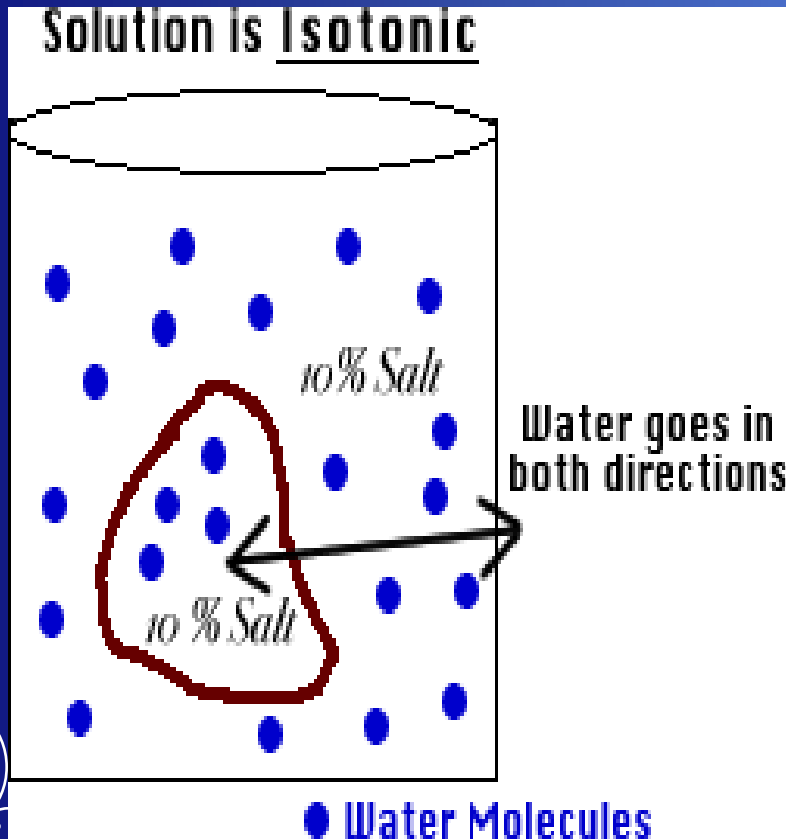


Hypotonic



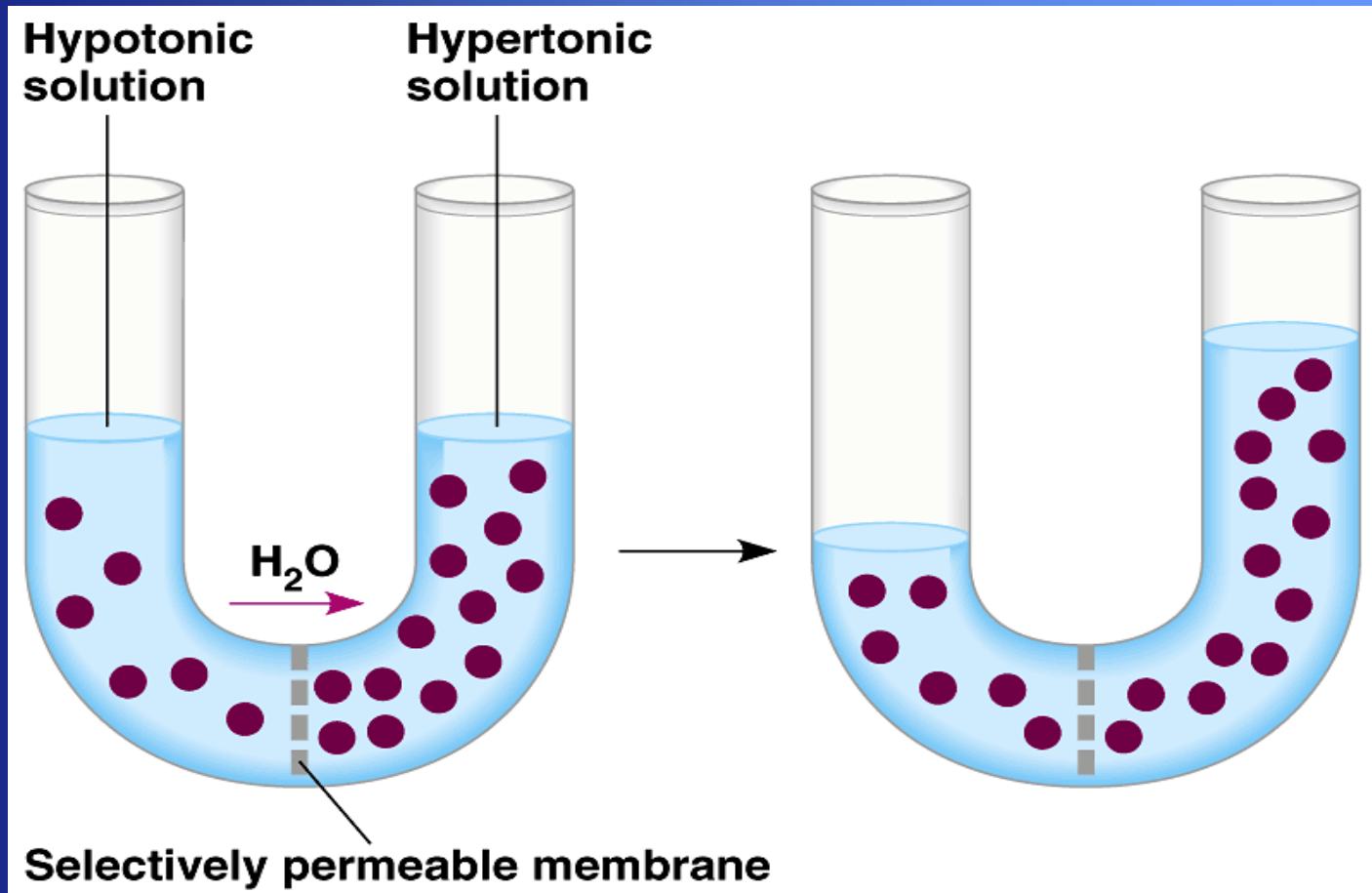
- Describes the side of the membrane with the lower concentration

Isotonic




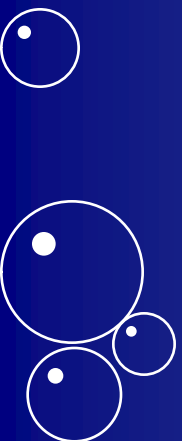

- When both sides of the membrane are in equal concentrations

Comparison: Hypertonic/Hypotonic



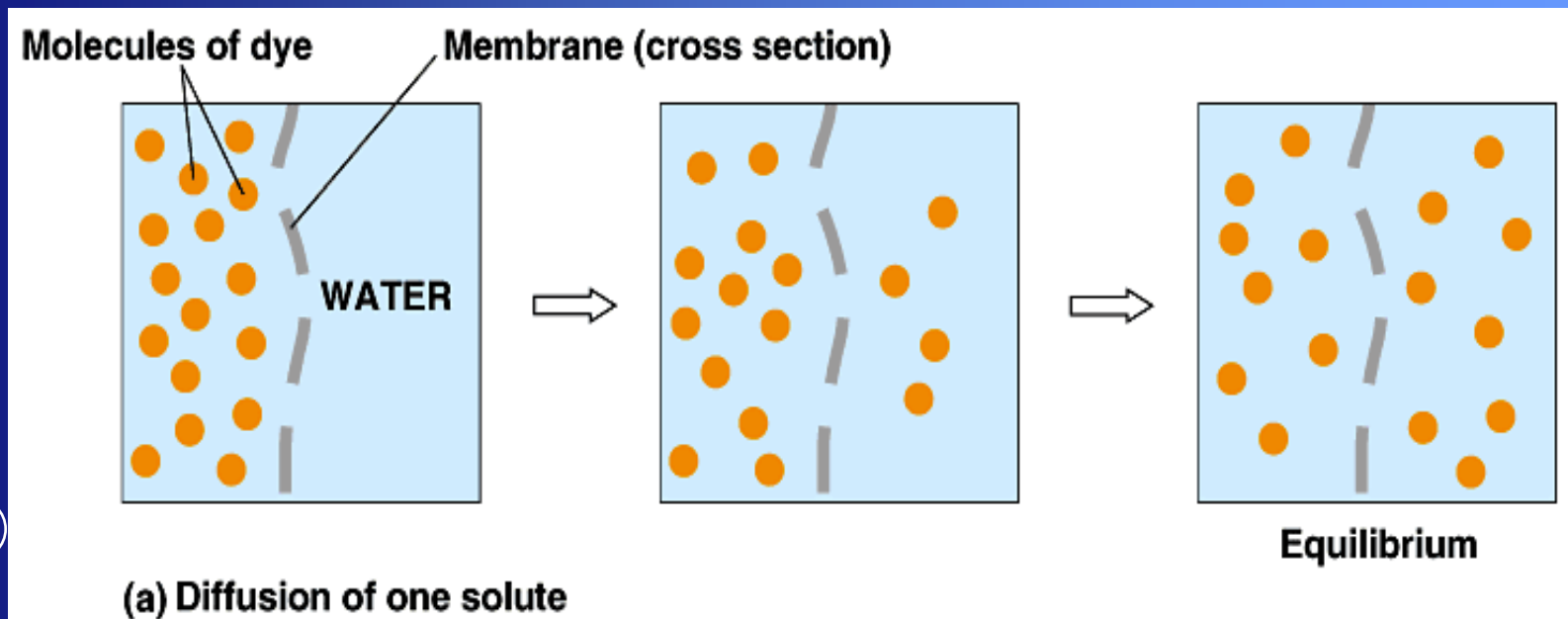


Equilibrium

- When the concentration of a solute is equal throughout the solution
 - Once equilibrium has been reached, particles continue to move across the membrane in both directions
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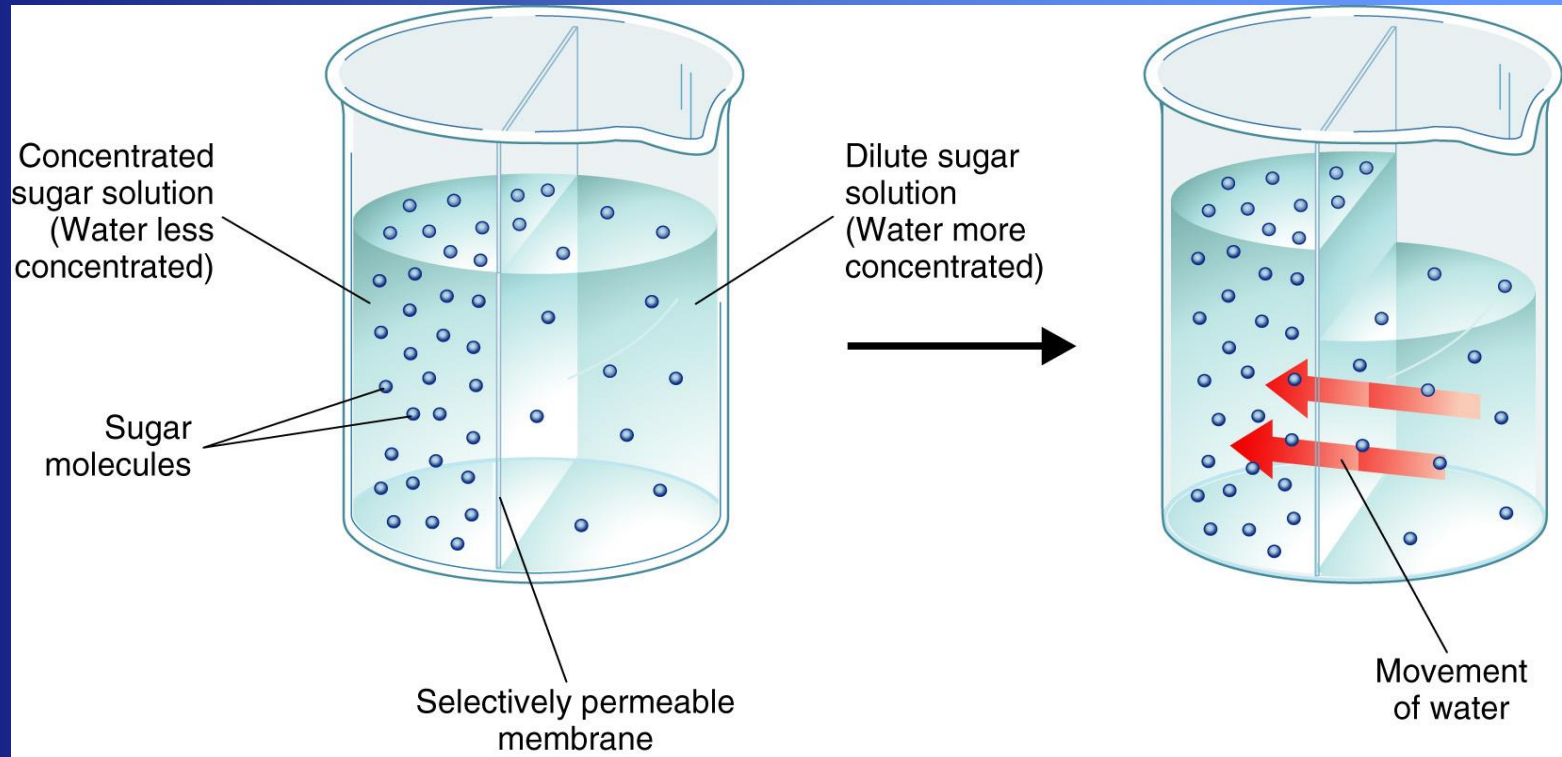
Diffusion

- The process where molecules in a solution randomly move from an area of higher concentration to an area of lower concentration



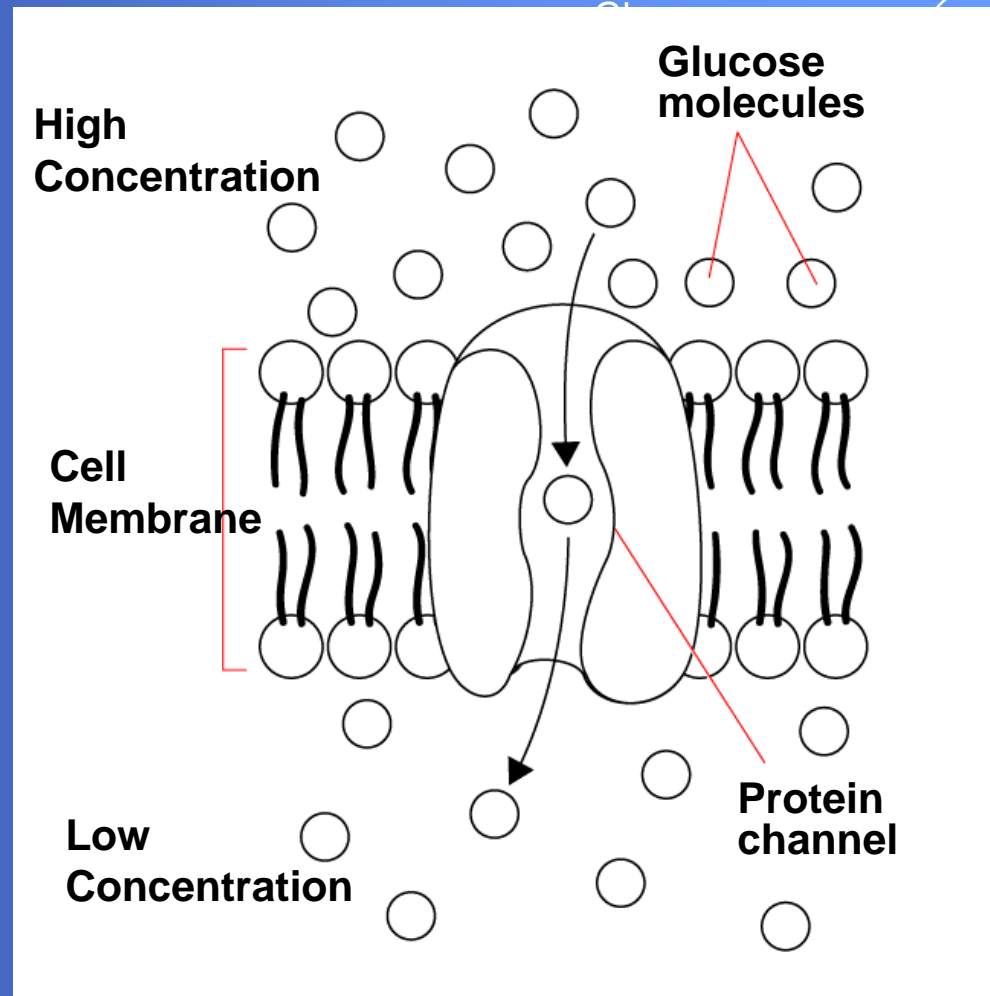
Types of Diffusion Without the Use of Energy

- Osmosis
 - Diffusion of water through a selectively permeable membrane



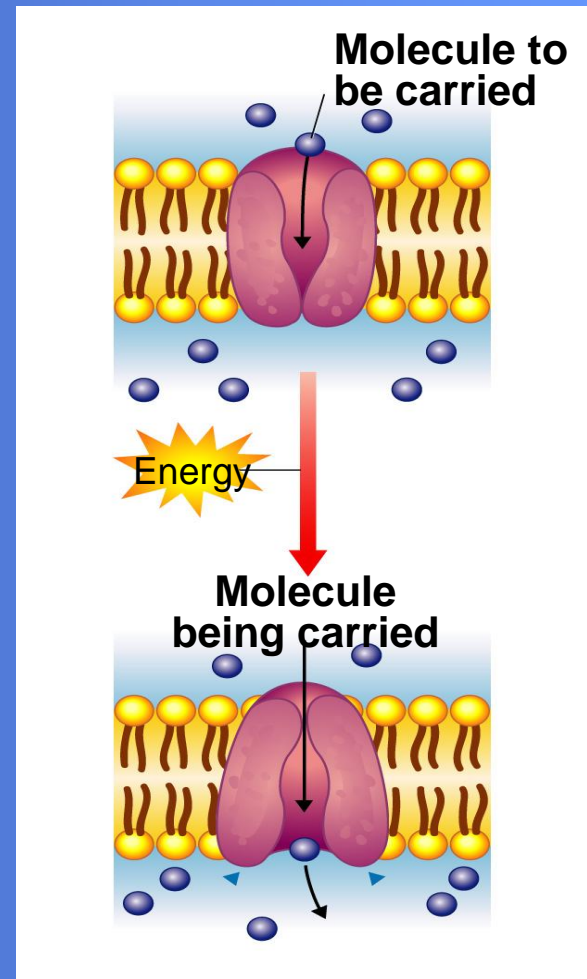
Types of Diffusion Without the Use of Energy

- Facilitated Diffusion
 - Diffusion of specific molecules performed by the channels of protein in the cell membrane
 - Process is fast and specific (Only 1 type of molecule can pass through each protein channel)




Types of Diffusion Requiring the Use of Energy

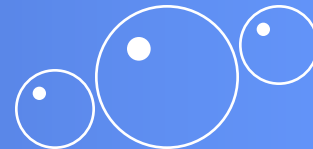
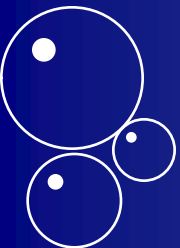
- Active Transport
 - Diffusion in the opposite direction
 - From an area of lower concentration to an area of higher concentration\
 - Specific molecules move through transport proteins or “pumps”





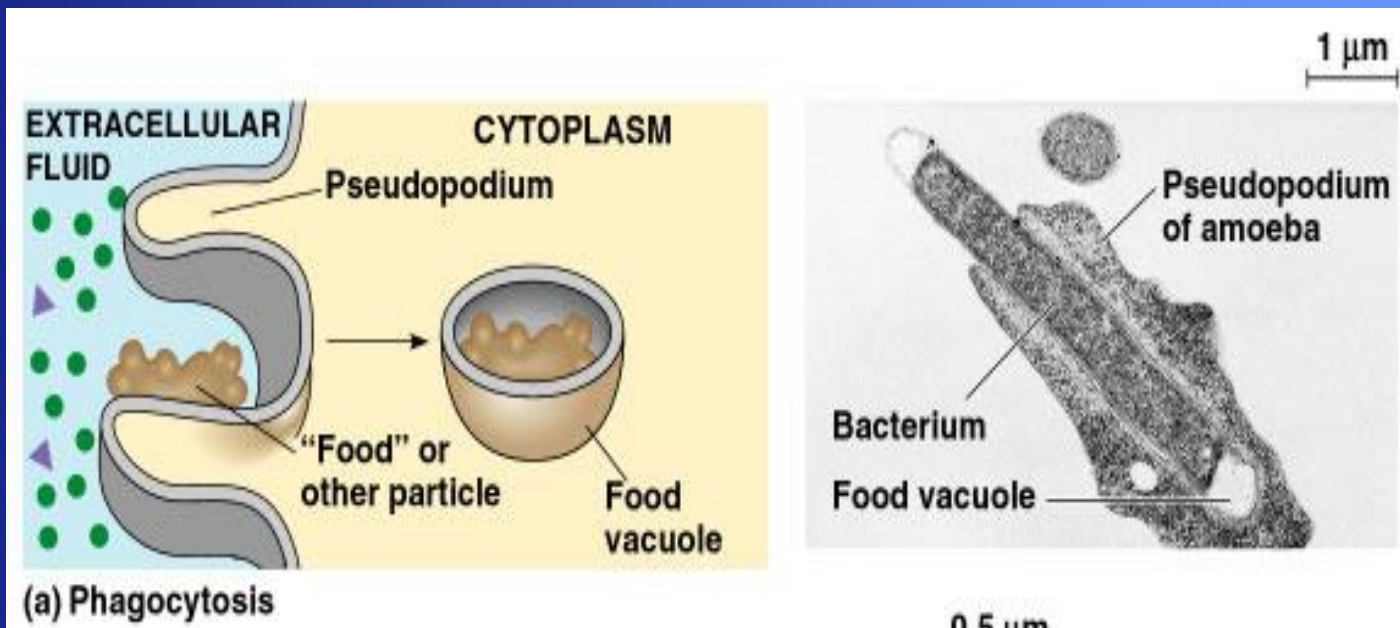
Active Transport con't

- Larger molecules move through processes called Endocytosis (movement of molecules into the cell) and Exocytosis (movement of molecules out the cell)
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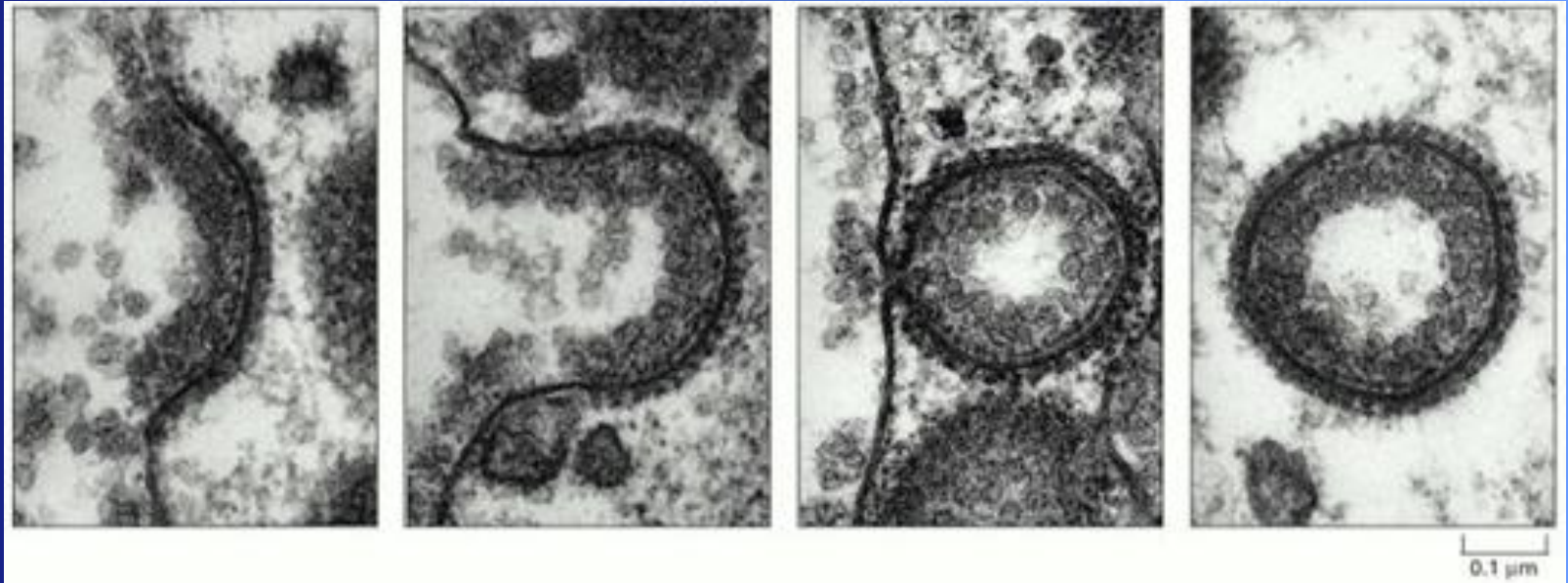
2 Types of Endocytosis

- Phagocytosis
 - Extensions of the cytoplasm surround a particle and package it within the vacuole

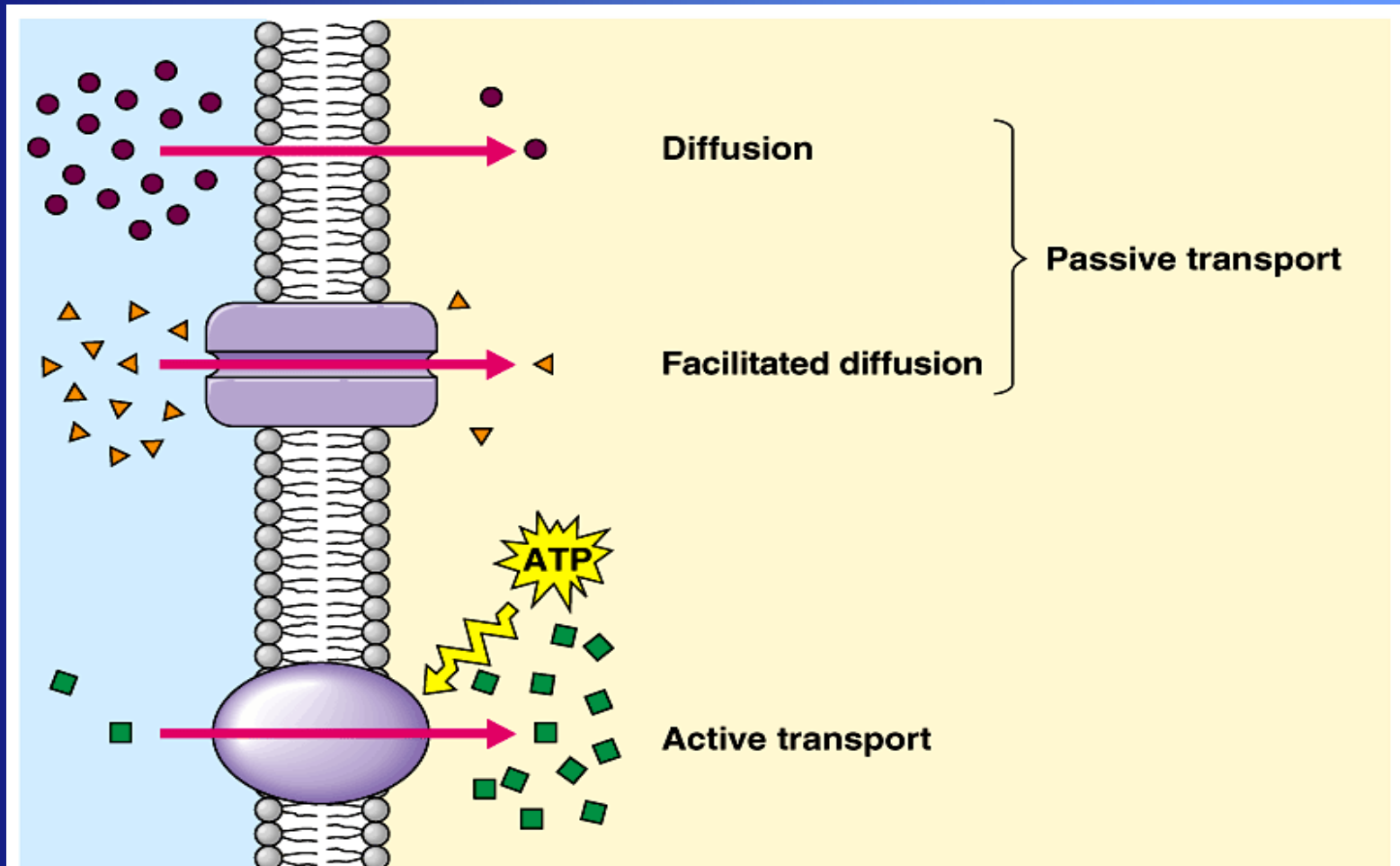


2 Types of Endocytosis

- Pinocytosis
 - Pockets form along the cell membrane, fill with liquid, and pinch off to form vacuoles within the cell



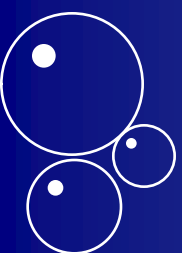

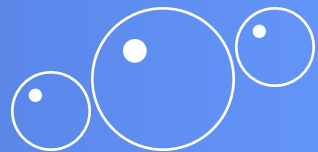


Comparison: Diffusion, Facilitated Diffusion, Active Transport



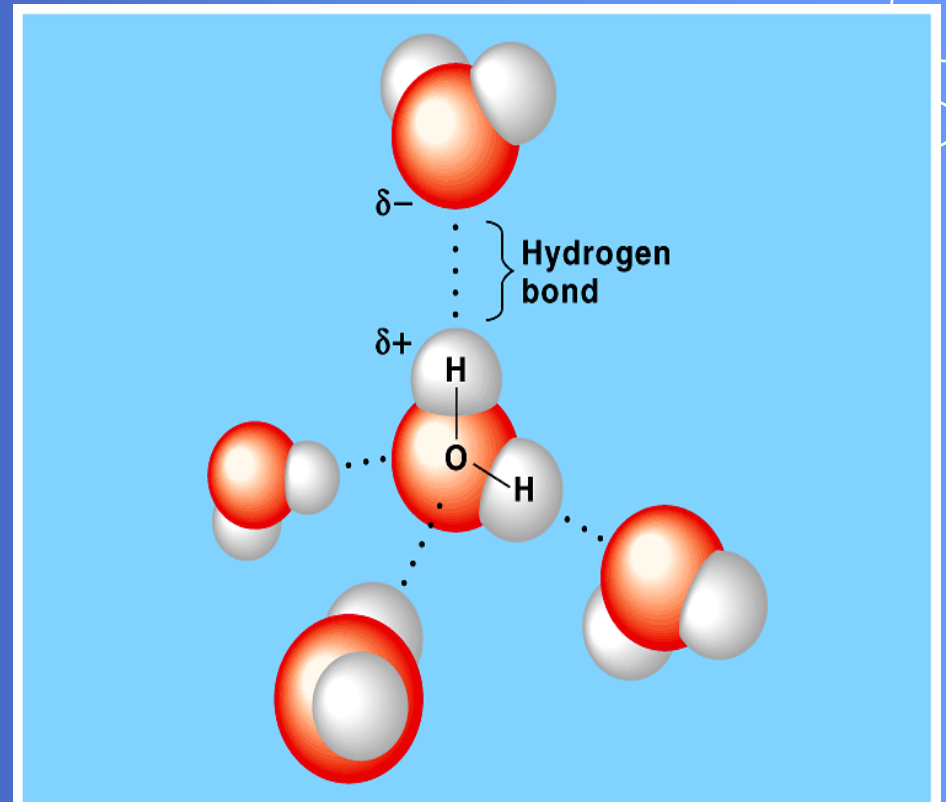


Water

- Most abundant compound in most living things
 - To understand how living things function we need to understand the chemical makeup and properties of water
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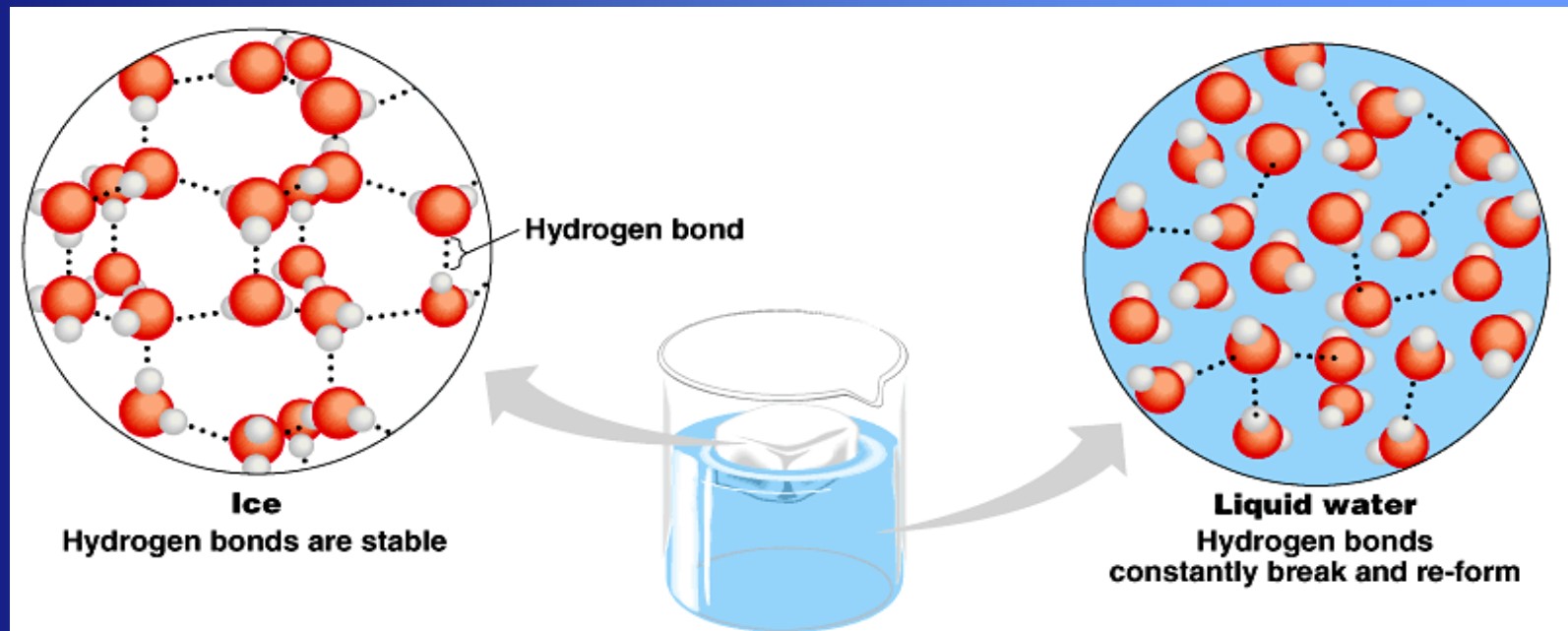
Properties of Water

- Water has a high surface tension
 - There is an uneven distribution of protons and electrons in a water molecule making it a polar molecule
 - This causes water to have a partial negative and positive charge (think of a magnet)
 - Therefore, water molecules attract to each other and form hydrogen bonds
 - Hydrogen bonds are weaker than covalent bonds (bonds where electrons are shared)





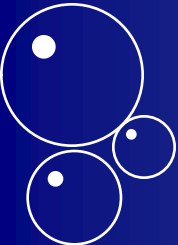

Properties of Water

- Expands when freezes
 - Hydrogen bonds are stable and more spread out
 - Ice is less dense than water causing ice to float





Properties of Water con't

- Creeps up small tubes (capillary action)
 - Resists temperature change
 - Has a high heat of vaporization
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