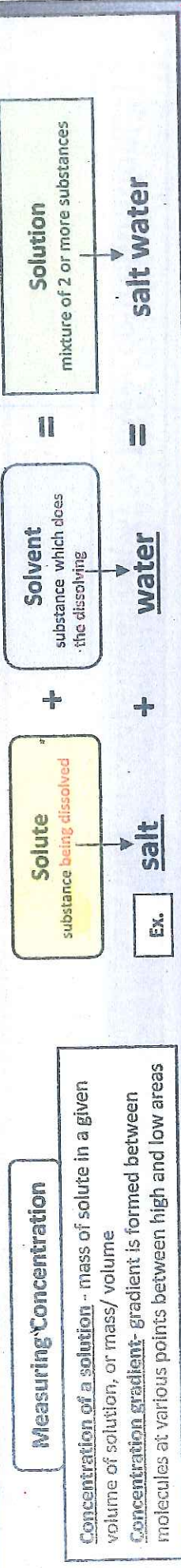


Cell Transport and Homeostasis



2 TYPES OF TRANSPORTATION

USES NO ENERGY

PASSIVE TRANSPORT

1. Diffusion

Molecules move from more concentrated area to a lesser one

Ex.

- ice cubes in your drink
- heat in your house
- CO2 inside a cell leaves it due to the concentration gradient
- Oxygen enters the cell by diffusion because the level is greater outside of it than inside

Equilibrium- reached when concentration of the solution is the same throughout; particles still continue to diffuse

Ability of a molecule to diffuse depends on:

1. size-tiny; will move through pores
2. chemical nature of membrane
3. type- if it will dissolve in lipids

2. Osmosis (WATER ONLY)

Diffusion of water through a selectively permeable membrane; water moves from a more concentrated area to a lesser one

When comparing 2 solutions:

1. **Isotonic**- are the same strength
Ex. red blood cell in solution
2. **Hypertonic**- more concentrated solution is on the outside of the cell
3. **Hypotonic**- less concentrated solution is on the outside of the cell

Osmotic Pressure- pressure on the hypertonic side of a selectively permeable membrane

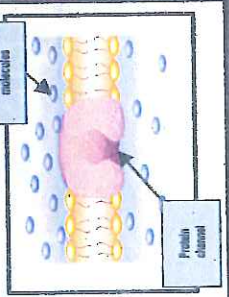
- water moves into a plant cell by osmosis, cells swell as they fill and exerts pressure which holds the plant up
- cells in large organisms are not in danger of bursting because they are bathed in fluids, such as blood that is isotonic
- some cells are surrounded by a cell wall that prevents them from expanding
- Turgor pressure-** pressure that water molecules exert against the cell wall
- contractile vacuole** in freshwater protozoans, removes water from cells so they don't burst

3. Facilitated Diffusion

The movement of specific molecules across cell membranes from a greater concentration to a lesser one through protein channels

- membrane has protein channels that act as carriers called **carrier proteins** to make it easy for some molecules to cross
- used when molecule is too big or are not soluble in lipids

Ex. glucose- too big to fit so it needs a protein to help it cross



ACTIVE TRANSPORT

USES ENERGY (ATP)

Molecules move from lesser concentration to a greater concentration; they go AGAINST a concentration gradient or UP the gradient

THIS REQUIRES ATP (energy) TO MOVE UP THE GRADIENT

- small molecules + ions are carried across membranes by proteins
- carrier proteins also called "pumps"; move substances up the gradient
- cells can concentrate substances with energy use; even when diffusion might move them in opposite direction

1. Sodium Potassium Pump

- protein carrier
- moves substances across membrane
- goes against concentration gradient
- uses energy
- specific to which molecules are carried by what protein
- used to send nerve impulses and for muscle contractions

2. Exocytosis

molecules LEAVE cell

- used for large substances
- release of large amounts of material from cell like protein (sac) surrounding membrane forcing contents out of cell
- used to secrete substances made by cell to the outside; eliminates waste
- Ex. hormones secreted from cell

3. Endocytosis

molecules pass INTO cell

- process of taking material into cell by infoldings or pockets
- pocket breaks loose from outer portion forming vesicle within cytoplasm
- vacuole fuses with lysosome; contents are digested

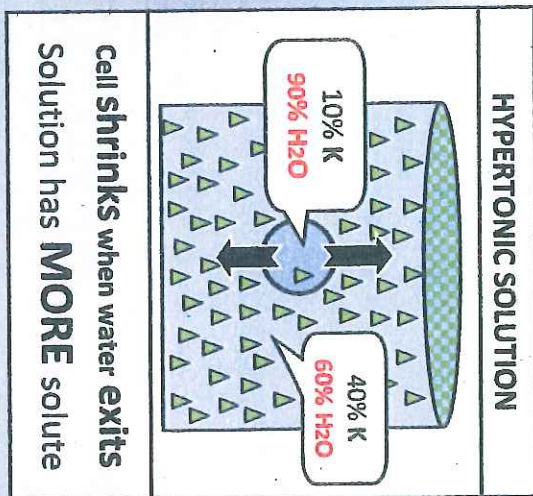
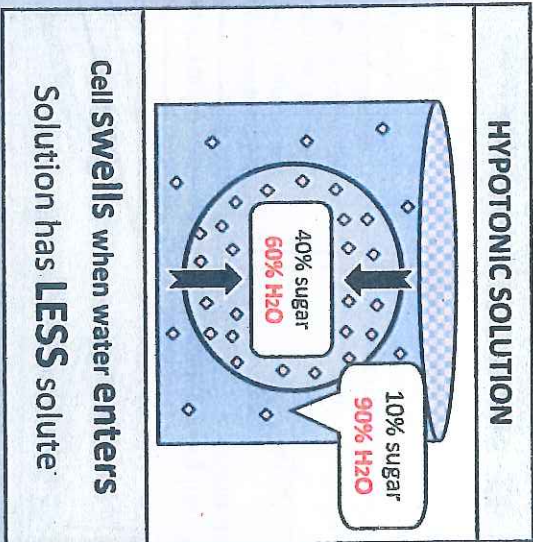
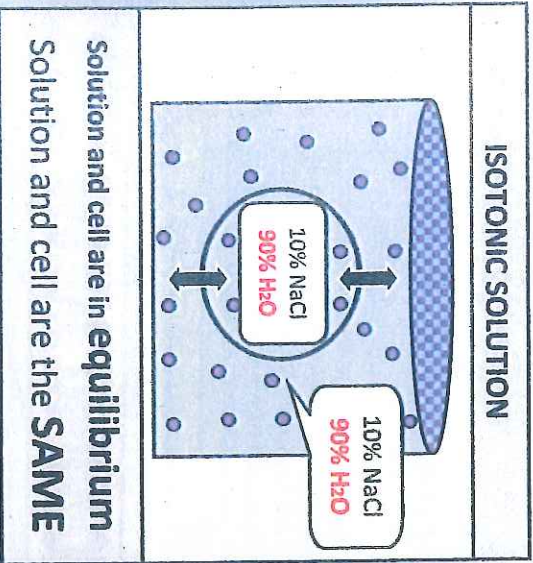
2 Types of Endocytosis

Phagocytosis (cell eating)	extensions of cytoplasm surround particle and package it within a food vacuole	Ex. engulfs bacteria
Pinocytosis (cell drinking)	pockets form along membrane + fill with liquid, then pinch off to form vacuoles	

PASSIVE TRANSPORT

OSMOSIS

Diffusion of **Water** through a selectively permeable membrane



Water always moves from higher concentration(%) to lower concentration(%)