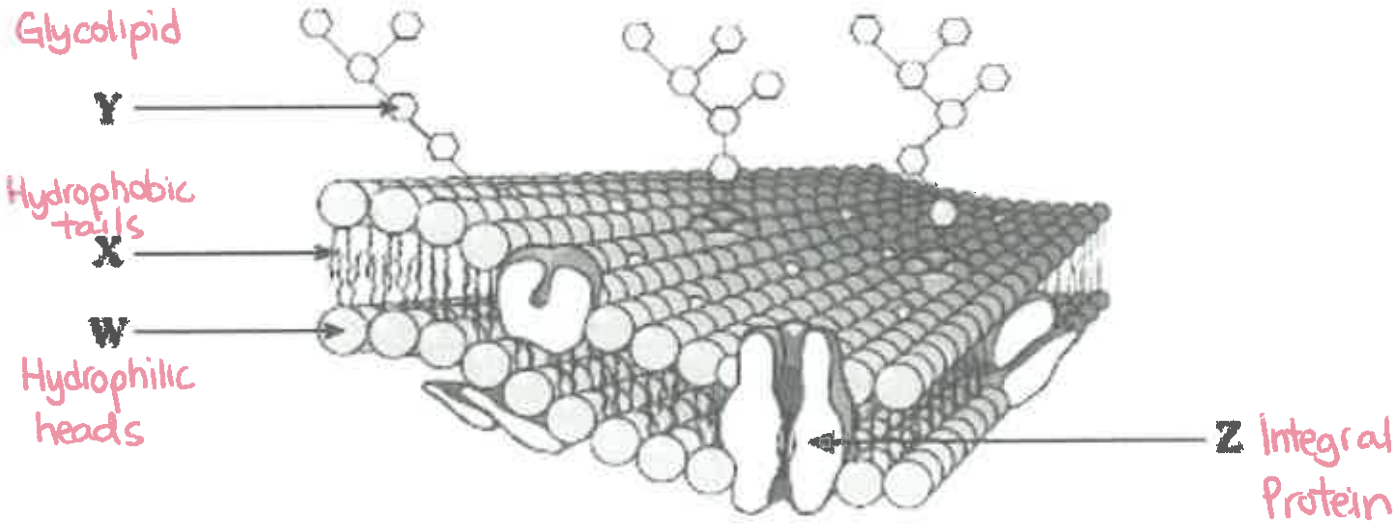
Part		What does it look like/where is it?	Function
Phospholipid bilayer		Double layer, hydrophilic heads (on the outside) and hydrophobic tails (to the centre)	Allows – water and dissolved substances to move through such as CO_2 and O_2
Cholesterol		In the lipid by layer A steroid	Reduces permeability
Glycolipids		A phosopholipid + glycogen (only found on the outside of the cell)	Act as the fingerprint of the cell Distinguish different cells
Peripheral proteins	Receptors	Found on the outside or inside of the membrane – has a receptor location	Molecule binds to it and causes a response on the inside or outside of the cell
	Enzymatic	Found on the outside or inside of the membrane	Catalyzes a reaction
Integral proteins	Channel Proteins	Like a tunnel – through the membrane	Substances move through
	Carrier Proteins	Large protein – passes through the full membrane	Combines with substance and helps it to move through
Glycoproteins	Recognition proteins	Protein + glycogen attached	helps to identify the cell
Cytoskeleton		Attached to proteins on the inside of the cell	Gives structure to the cell, helps it keep its shape

Try This:



1) Label W, X, Y, and Z

2) Which labelled structure is responsible for cell recognition and communication?

Glycolipid (Y)

3) What is this structure called? Phospholipid bilayer

Membrane transport Name: _____

Goal: to determine how stuff gets into and out of cells.

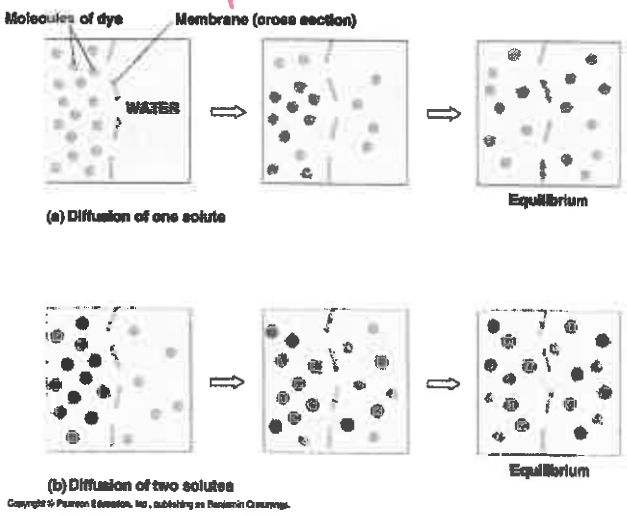
he cell membrane is **selectively** permeable

Passive Transport

- Diffusion, osmosis and facilitated transport
- Oxygen, carbon dioxide, water, alcohol pass through the lipid bilayer unaided
- Ions and charged molecules (amino acids and sugars) are assisted by transport proteins (channel and carrier)
- Move from an area of higher concentration to an area of lower concentration – no ATP energy is required

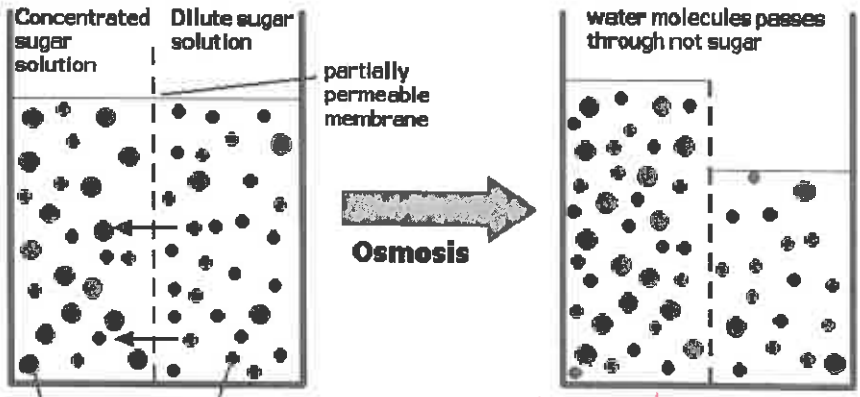
1. **Diffusion**

   - Movement of gases like carbon dioxide and oxygen from higher to lower concentration



2. **Osmosis**

   - Movement of water from high to low concentration

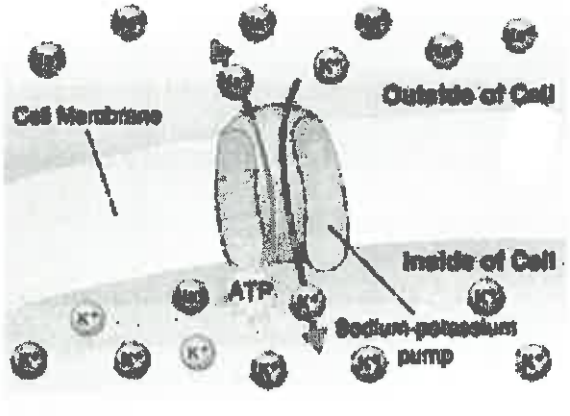


3. **Facilitated Diffusion**

   - Transport of glucose and amino acid
   - Channel proteins act like a tunnel for the molecules to pass through
   - Carrier proteins change shape and help the molecule to pass through

Active Transport:

- most of a cell's energy is used for active transport
- Molecules move against the concentration gradient from low to high concentration
- channel and carrier proteins are required
- Example: nerve and muscle cells move sodium and potassium in using the sodium potassium pump (an ion pump)

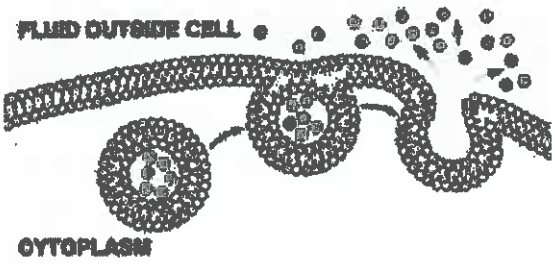


Transport of Macromolecules

- Movement of proteins, fats, starch and glycogen

Exocytosis

- Vesicles formed by the Golgi Apparatus carry a specific molecule to the cell membrane
- Vesicle fuse with the membrane and secretes the molecules outside the cell

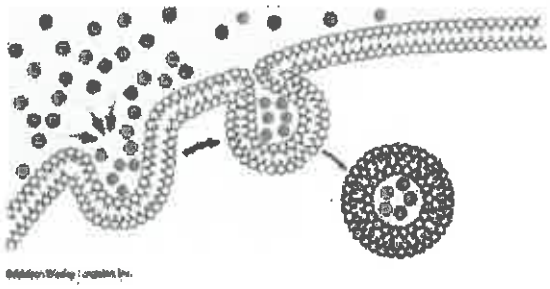


Endocytosis

- Take in molecules
- The membrane encloses to form a vesicle that pinches off

2 types

- **Phagocytosis** (cell eating)
  - Large items such as macromolecules or another cell
- **Pinocytosis** (cell drinking)
  - Liquid or small particles



Review of membrane transport

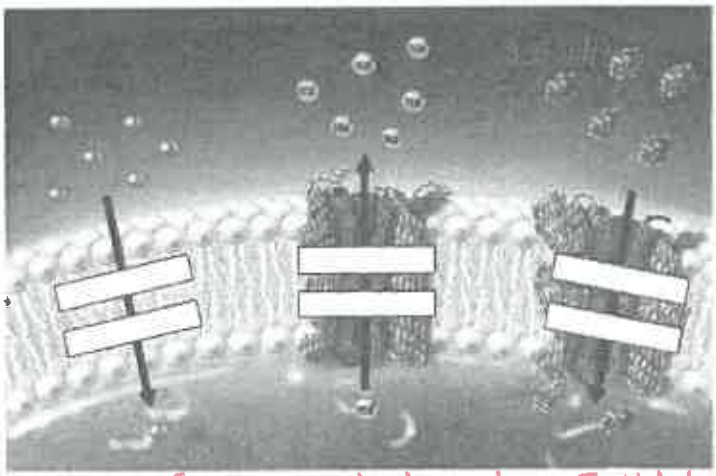
Simple diffusion

Facilitated diffusion

Active transport

Requires energy input

Does not require energy input



- Simple diffusion
- Does not require energy input

- active transport
- Facilitated diffusion

Requires energy input

Membrane Transport notes

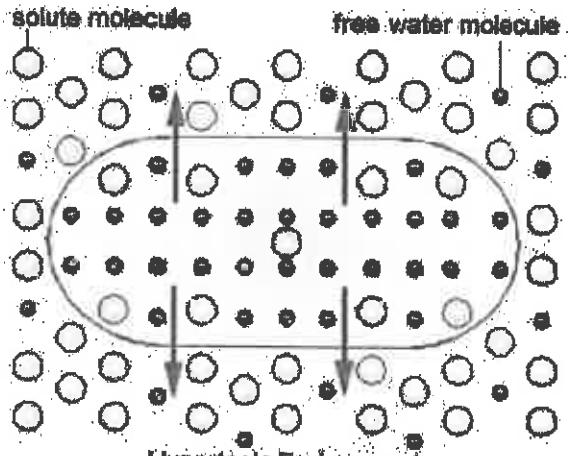
TONICITY: *Strength of a solution*

Name: _____

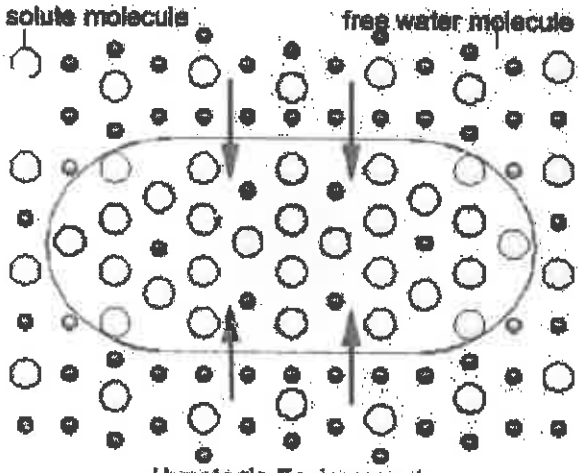
DEFINE SOLUTE: A substance dissolved in a solution

3 kinds of solutions:

1. **Hypertonic** – solution has more [solute] than the cell – water moves out (because there is more water inside the cell compared to the outside) – as a result the cell shrinks



Hypertonic Environment:
The solute concentration is greater outside the cell; the free water concentration is greater inside.
Free water flows out of the cell.

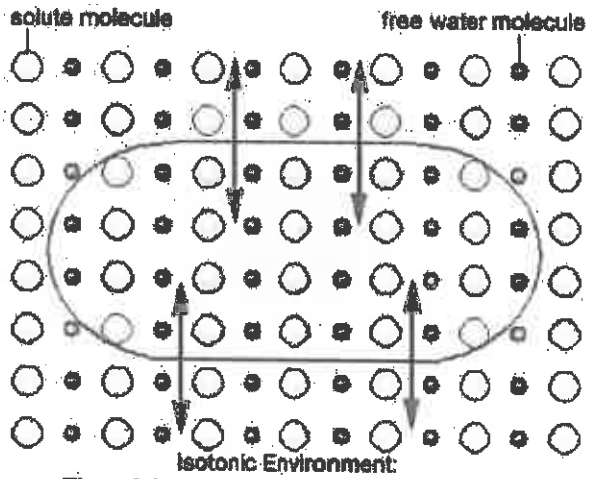


Hypotonic Environment:
The solute concentration is greater inside the cell; the free water concentration is greater outside.
Free water flows into the cell.

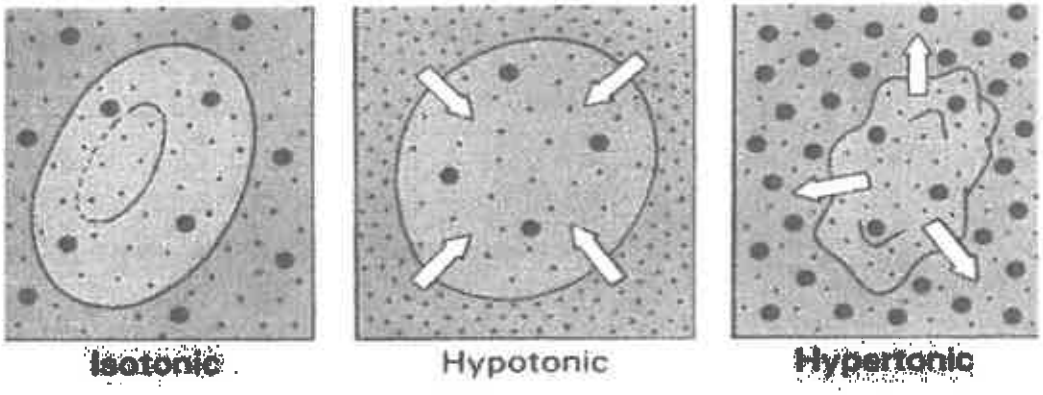
2. **Hypotonic** – solution has less [solute] than the cell – water moves in (because there is more water outside the cell (high concentration) and it moves to where there is less water (low concentration) – as a result the cell will expand and sometimes bursts

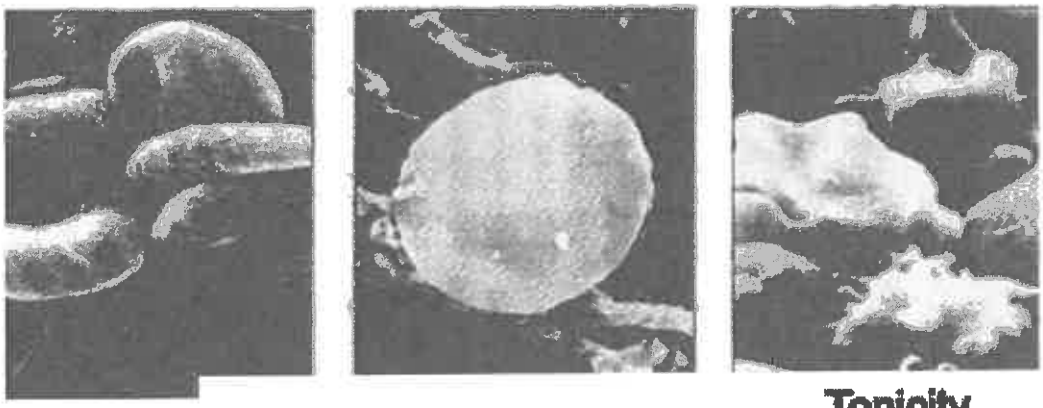
3. **Isotonic** – solution has the same [solute] as the cell - no net movement. As a result the cell stays the same – no change

blood *is isotonic to cells*

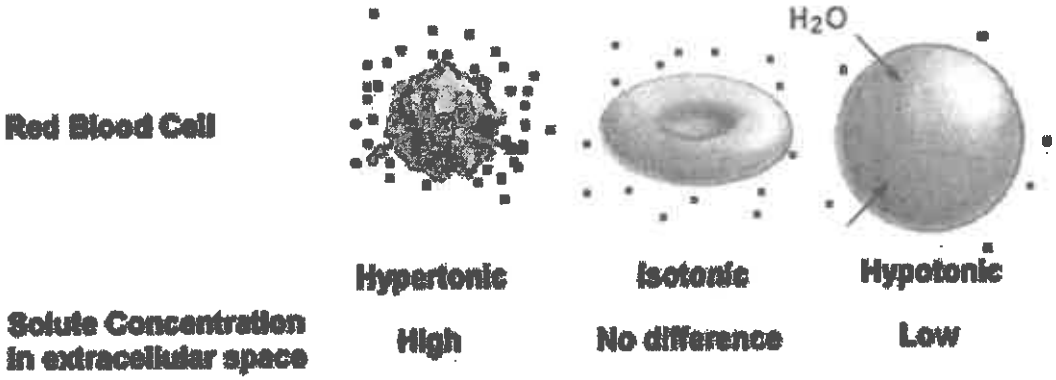


Isotonic Environment:
The solute concentration and the free water concentration are the same inside and outside the cell.
Water flows in and out of the cell at an equal rate.





Tonicity



Now Try this:

1. http://www.biologyjunction.com/tonicity%20animations.htm