NOTES 2.3

Chapter 2 - Cell Structure and Function
Lesson 3 - Moving Cellular Material

The membranes of cells and organelles perform 2 different functions –

- form boundaries between cells
- control the movement of substances into and out of cells

Cell membranes are **semi-permeable**.

Q: What is semipermeable?
A: only certain materials can enter or leave a cell

Ex. water, oxygen, and carbon dioxide

Substances can pass through a cell membrane by one of several different processes. The type of process depends on the physical and chemical properties of the substance that is passing through the membrane and if energy is required for the process to work.

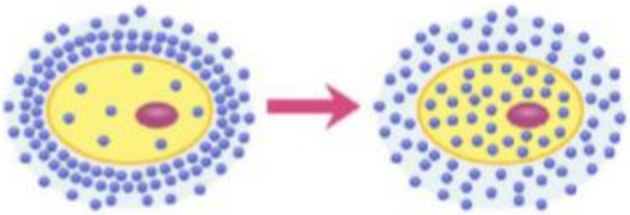
Passive Transport

Q: What is passive transport?
A: the movement of substances through a cell membrane WITHOUT using the cell's energy

Ex. water, oxygen, and carbon dioxide

Substances can move into and out of a cell WITHOUT using energy by one of 3 ways -

1. diffusion



- the movement of substances from an area of high concentration to an area of low concentration through a cell membrane
- caused by molecules of a substance moving to "spread out" evenly throughout an area known as equilibrium

☑ Demonstration - How Do Molecules Move?
Demonstration - Diffusion in Action

2. osmosis

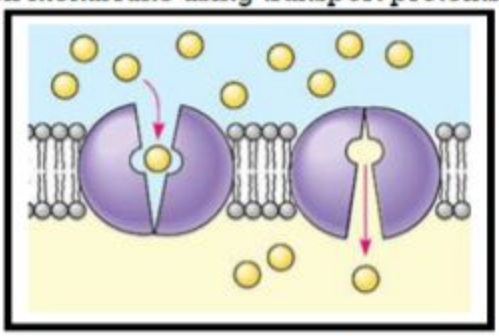
- the movement of ONLY water molecules through a cell membrane
- important b/c cells cannot function without adequate water
- moves molecules from an area of high concentration to an area of low concentration

Some molecules are too large to pass through the cell membrane and need assistance.

3. facilitated diffusion

- the movement of large molecules through a cell membrane using transport proteins

There are 2 types of transport proteins -



carrier proteins carry glucose

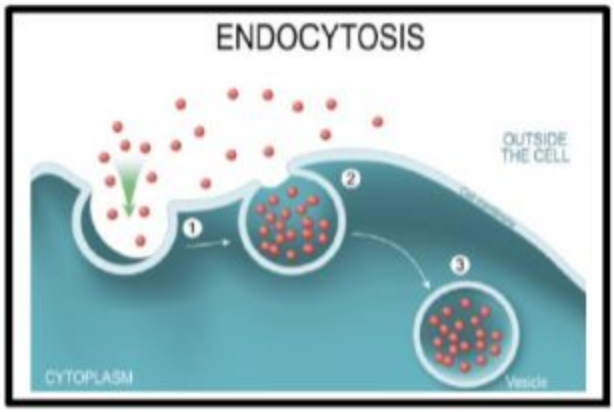
channel proteins form pores & transport atomic particles such as sodium & potassium

Active Transport

Q: What is active transport?
A: the movement of substances through a cell membrane using energy

- requires ENERGY!
- moves substances from areas of low concentration to areas of high concentration
- cells can transport molecules throughout itself by "picking up" or engulfing (surrounds a particle and takes it in)

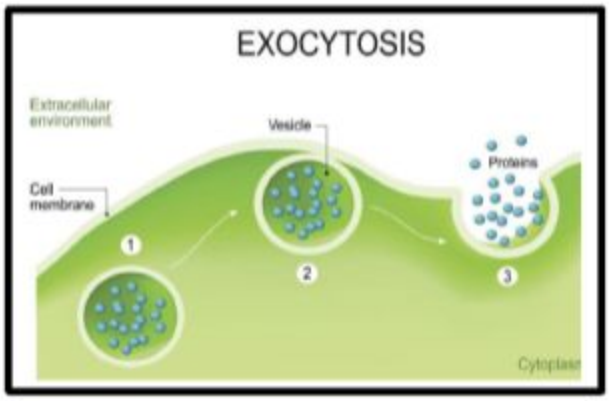
There are 2 types of active transport -



1. endocytosis

- the process during which a cell takes in a substance by surrounding it with the cell membrane

Ex. removal of bacteria & viruses within a cell



2. exocytosis

- the process during which a cell's vesicles release their stored substances outside the cell

Ex. release of proteins & other substances