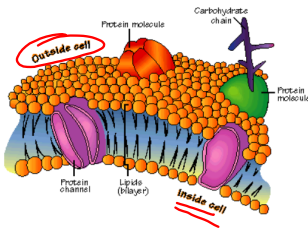


Name: _____

Cell Membranes

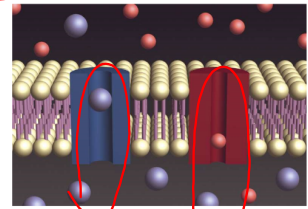
Cells allow some materials to enter or leave the cell, but not others. They are permeable to some materials and impermeable to others.



- IMPERMEABLE** means: Doesn't let anything pass, such as the example of the plastic "membrane" in the demo.
- PERMEABLE** means: allows everything through, such as the example of the open beaker "membrane" in the demo.
- SELECTIVELY PERMEABLE** means: allows certain things in/out, such as the example of the metal grate "membrane" in the demo. coffee filter

In general, SMALL molecules, such as ions (Na^+) can pass easily through the membrane, while medium and large molecules such as full length molecules can only pass through if the cell so desires. As the membrane only allows certain substances to enter or leave the cell, the cell membrane is said to be

Selectively permeable



Glucose
Further, for larger molecules to enter or leave the cell, they must use protein channel built specifically for that molecule.

protein channel

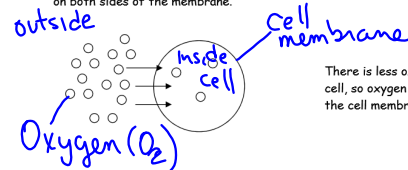
Movement of Molecules:

Diffusion

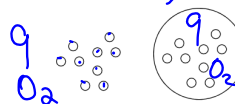
As you should recall from last year, molecules are constantly moving and colliding with other molecules. When they collide, they bump off each other and cause the molecules to move from one area to another.

* **DIFFUSION** is the movement of molecules from an area of high concentration to Low Concentration.
[high] [low]

[high] [Low] cell
Diffusion is one of the ways substances move into and out of the cell through the cell membrane. For example, when the concentration of oxygen is low inside the cell and higher outside, the oxygen will diffuse across the cell membrane. Diffusion will continue until the concentration is equal even on both sides of the membrane.



There is less oxygen inside the cell, so oxygen diffuses across the cell membrane into the cell.



Diffusion continues until there is the same concentration of oxygen inside and outside the cell.

As Diffusion does not require any energy to occur, it is a form of

PASSIVE TRANSPORT

No energy needed

Identify the diagrams below as to the type of membrane that they would be:

Diffusion - maintains cell equilibrium

Image	Type of membrane and WHY
	<i>selectively permeable (Semi-permeable) because only small molecules can get through</i>
	<i>Impermeable nothing can cross</i>
	<i>permeable because both the star and circle particles can fit across the "holes" in the membrane</i>

makes molecules EQUAL on both sides

OSMOSIS ⊗ Special kind of Diffusion

Sometimes the barrier, such as the cell membrane, will not allow the larger molecules across. However, WATER will still be able to diffuse across the membrane.

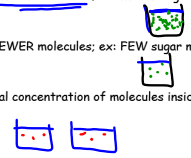
This is OSMOSIS: The movement of WATER across the membrane

New Terms: *hyper = a lot of energy*

Hypertonic solution: an area with MANY molecules; ex: MANY sugar molecules dissolved in water

Hypotonic solution: an area with FEWER molecules; ex: FEW sugar molecules dissolved in water

Isotonic solution: an area with equal concentration of molecules inside and out of the "cell"



See pages 28 - 29 in textbook for added support

- Questions:**
- P29 # 1, 3, 4, 5
 - Provide 3 examples of diffusion that might occur in your daily lives (think of movement of airborne particles)
 - What is an example of
 - Permeable membrane in the real world
 - Impermeable membrane in the real world
 - Selectively permeable membrane in the real world

SUGAR CANT

Diagram explaining Osmosis:

Semi-permeable because water molecules can fit across

more sugar more concentrated

○ = water molecule
● = sugar molecule

Hypotonic solution Hypertonic Solution

Thus, Osmosis, is the movement of water from a hypotonic solution to a hypertonic solⁿ

**deals with concentrations*

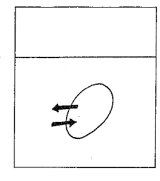
pepper

hypotonic compared to salt solution

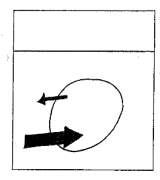
hypertonic compared to sugar solution

salt hypertonic compared to pepper solution

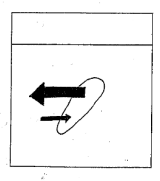
- Assigned work:
- READ pages 30-32 and answer Q #1-5 on page 33
 - Identify each of the solutions below as: Hypertonic, Hypotonic or Isotonic



The concentration of salt molecules outside the cell is equal to the concentration of salt molecules inside the cell. This means that the concentration of water is the same inside and out. There is no overall movement of water into or out of the cell, although individual molecules of water will pass both ways. The shape and size of the cell do not change.



The salt concentration outside the cell is less than that in the cell. This means that the concentration of water molecules is greater outside the cell. More water molecules move into than out of the cell. The cell increases in size and may eventually burst.



The concentration of salt outside the cell is greater than found inside the cell. This means that the concentration of water is greater inside the cell. More water molecules move out of the cell than into the cell. The cell decreases in size.

Lab Demonstration: Osmosis with an egg

Step 1: Egg placed in vinegar overnight

Hypothesis:

It is believed that _____

Observations:

Step 2: Placing the egg in corn syrup

Hypothesis:

It is believed that corn syrup is a hypotonic/hypertonic/isotonic (circle) solution because _____

Thus water will move from the _____ to the _____

Observations:

Step 3: Remove the egg from the corn syrup gently and place egg in a beaker of w

Hypothesis:

It is believed that water is a hypotonic/hypertonic/isotonic (circle) solution because _____ Thus

water will move from the _____ to the _____

Observations: