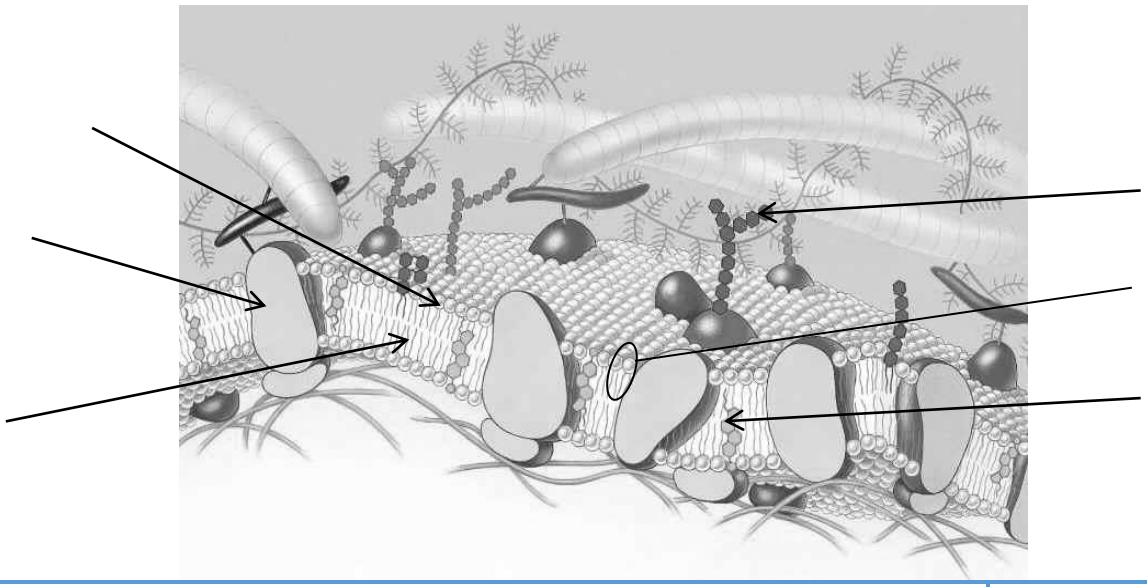
Name: _____

Cell Membrane and Cell Transport - PreAP



I. Cell Membrane (cells need an inside and outside)

a. separate cell from its environment
b. cell membrane is the boundary
c. cell membrane controls what gets in or out
d. made up of a _____ bilayer

Name 2 other names for a cell membrane.

What molecules can get directly across the cell membrane?

molecules IN to the cell	molecules OUT of the cell

- _____= only some molecules can get in or out of the cell

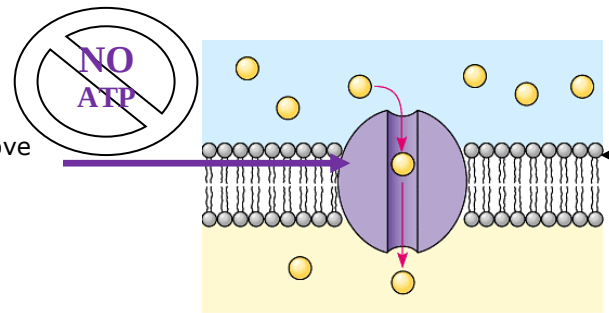
- Cells have "doors" that allow molecules to move through the membrane

  - _____allow substances (other than lipids) in and out

    - specific channels allow specific material in & out
    - H2O channel, salt channel, sugar channel, etc.
    - Remember- proteins are shape specific! Molecule shape = channel shape

Why do molecules move through the membrane if you give them a channel?

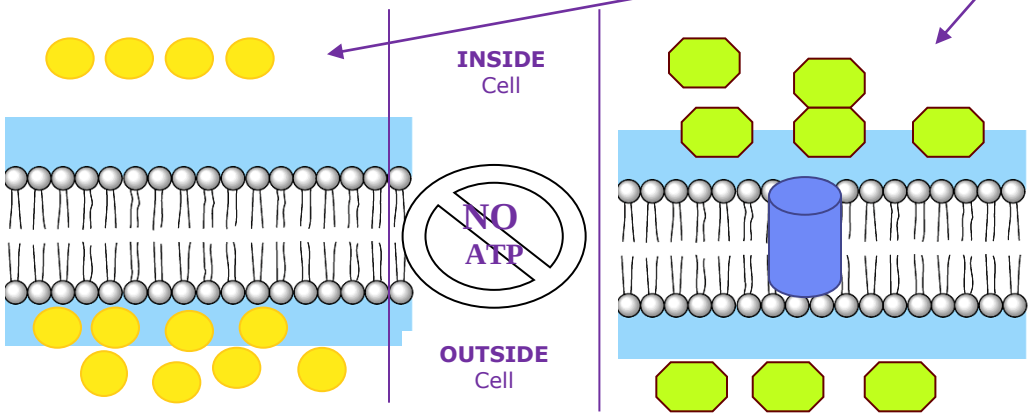
Proteins act as doors in the membrane.
• Channels are designed to move specific molecules through cell membrane



Explain why the lipids moved the direction they did in the diagram to the left.

II. Passive Transport (Diffusion & Facilitated Diffusion)

- Movement of molecules from HIGH to LOW concentration gradient



Look at the diagrams to the left:

1. Label the molecule concentration with an "H" and an "L"

2. Draw an arrow to show which direction the sugars will go

Diffusion – naturally moves

Facilitated Diffusion uses a protein

III. Active Transport

Cells may need molecules to move _____concentration gradient

a. need to pump from LOW to HIGH using energy

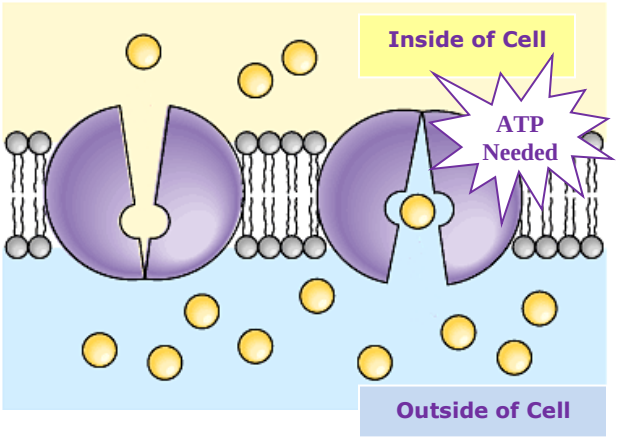
b. uses a protein pump

c. requires _____

ATP Needed

What energy molecule is required to help pump molecules against the concentration gradient?

ATP



1. Label the diagram to the left with "H" for high concentration and an "L" for low concentration

2. This cell needs the move the products it has made out of it

3. Draw an arrow to show which direction the molecules will go in the diagram to the left

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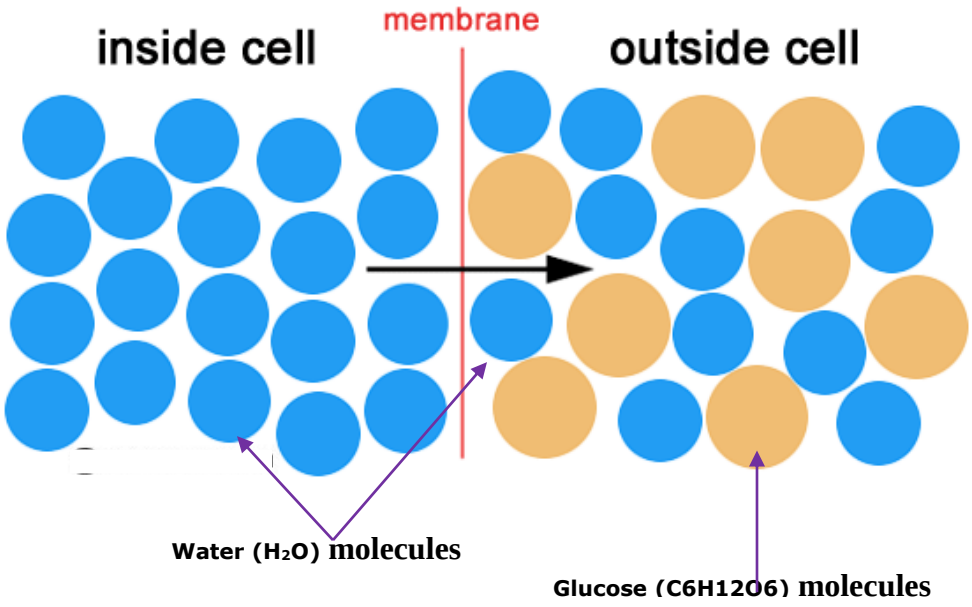
IV. Osmosis: Diffusion of _____ across cell membrane

- Diffusion of _____ from_____concentration of water to _____concentration of water molecules

    a. NO energy required
    b. Cell survival depends on balancing water uptake & water loss
    c. Homeostasis



Look at the diagram to the left.

1. Label the water concentration "H" for high and "L" for low concentration

2. Why do the water molecules move to the outside of the cell (what is the cell trying to reach)?

3. Why is NO energy required with osmosis?

TONICITY:

- There are 3 different types of solutions
    1. Hypertonic
    2. Hypotonic
    3. Isotonic

Solvent – dissolves solute
Solute – solid part of solution
Solution – mixture of solvent and solute

Example: Kool-Aid

Solvent:

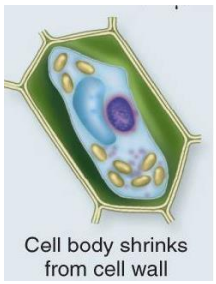
Solute:

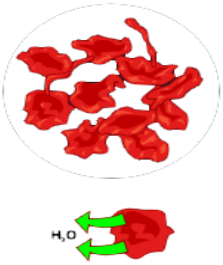
Solution:

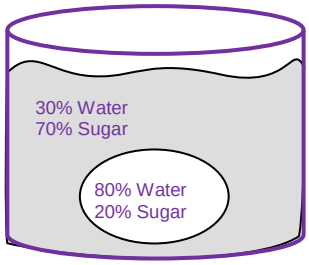
V. Hypertonic Solutions

- The concentration of _____ is greater _____ the cell than _____ the cell.
- The cell will _____

Draw an arrow in the diagram below to show which way water will move







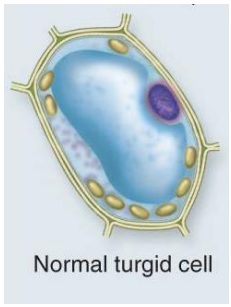
In a HYPERTONIC solution, which way will water move?

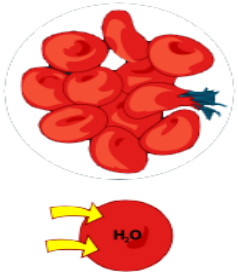
What will happen to the cell?

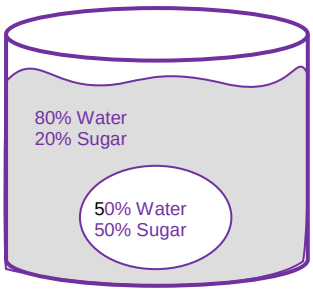
VI. Hypotonic Solutions

- The concentration of _____is greater _____ the cell than _____ the cell.
- The cell will swell

Draw an arrow in the diagram below to show which way water will move







In a HYPOTONIC solution, which way will water move?

What will happen to the cell?

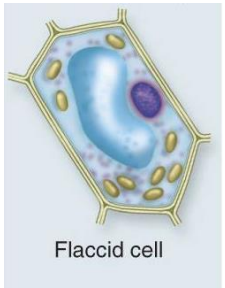
Define LYSE (LYSIS)

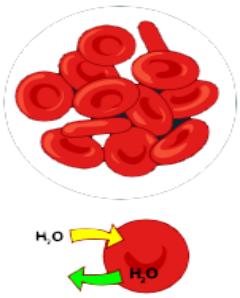
What advantage does a plant cell have over an animal cell in a hypotonic environment?

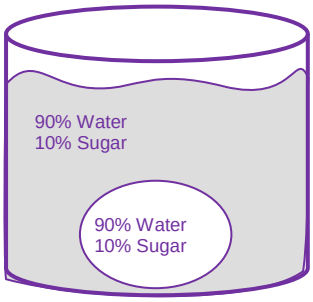
VII. Isotonic Solutions

- The concentration of solute is _____both inside the cell and outside the cell
- There will be NO net change in the size/mass of the cell

Draw an arrow in the diagram below to show which way water will move

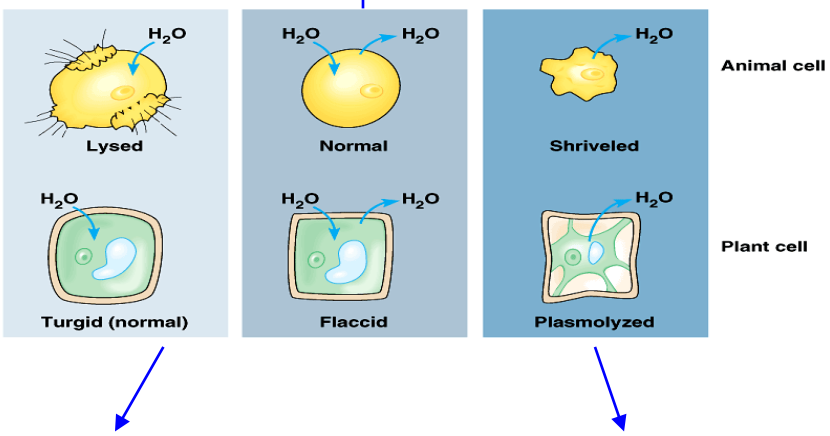






In an ISOTONIC solution, which way will water move?

What will happen to the cell?



Looking at the diagram to the left, which solution would you want to expose fruits and vegetables to at the grocery store? WHY??

Now, let's practice:

For the three beakers below, draw an arrow to indicate which way water will travel and then identify what type of solution the cell was placed in.

A. _____ B. _____ C. _____

What will happen to:

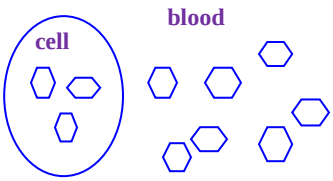
Cell A:

Cell B:

Cell C:

After digestion of a carbohydrate:

= glucose molecule



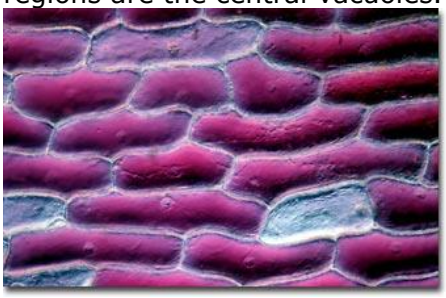
a. Which side has the higher concentration of glucose?

b. Which way will the glucose go?

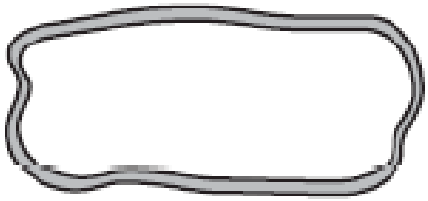
c. Does this require energy?

d. Is this active or passive transport?

The plant cells below are in their normal solution of 0.5% salt. The dark shaded regions are the central vacuoles.



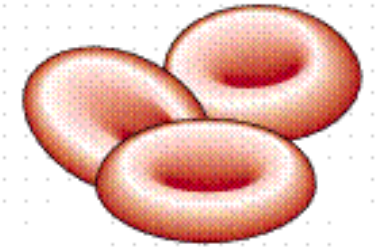
Draw what the cell's vacuole would look like after it had been placed in a 1.5% salt solution.



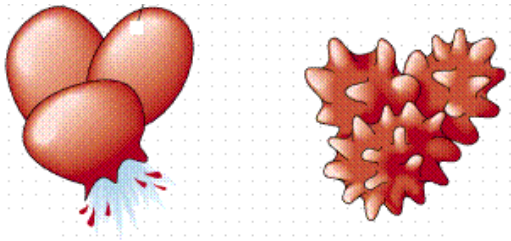
What type of solution was the plant placed in?

What would happen to the cell if it were placed in a 0% salt solution?

The image below shows red blood cells in an isotonic solution of 1.5% salt.



Circle the image below that would best represent blood cells exposed to a 0% salt solution.



What type of solution was the blood cell placed in?

What would happen to the cell if it were placed in a 10% salt solution?