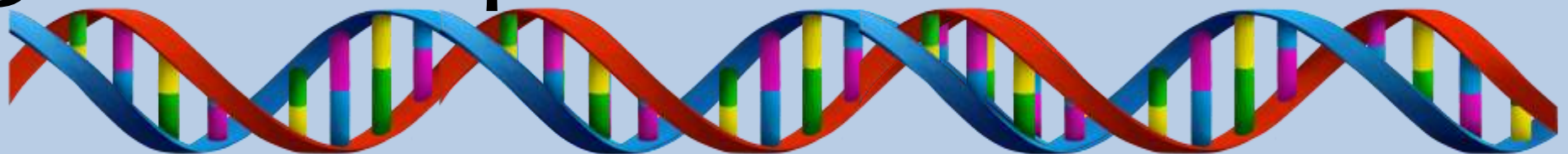
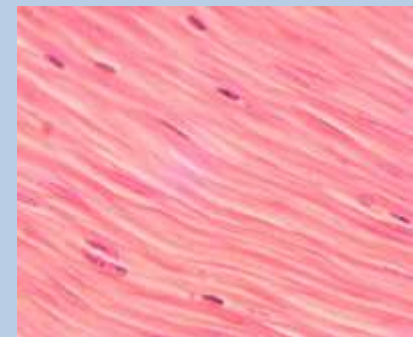
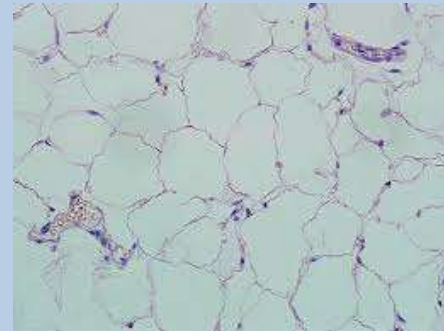
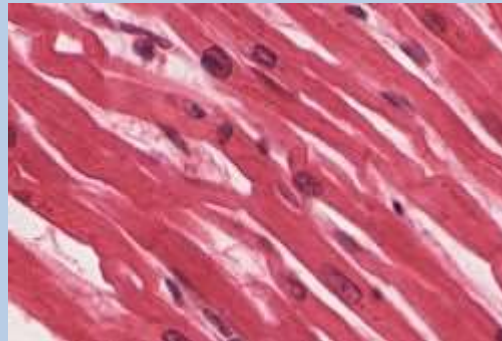
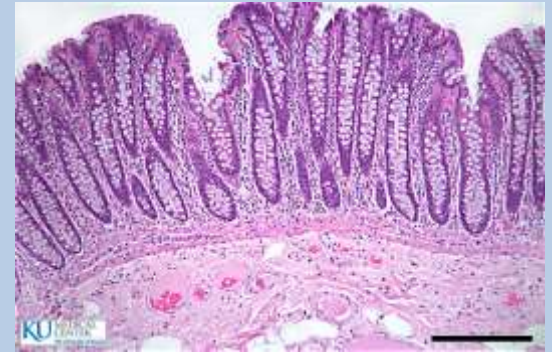
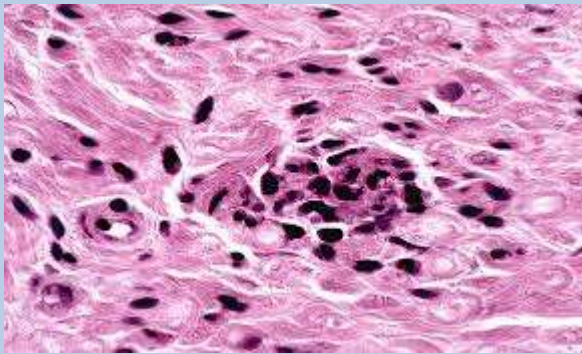


1. What allows multicelled organisms to maintain homeostasis?
2. What allows unicelled organisms to maintain homeostasis?
3. What allows molecules to pass through the membranes?
4. The pancreas is an organ that *produces enzymes*. Which organelle would be abundant in pancreas cells?
5. What does polar mean?



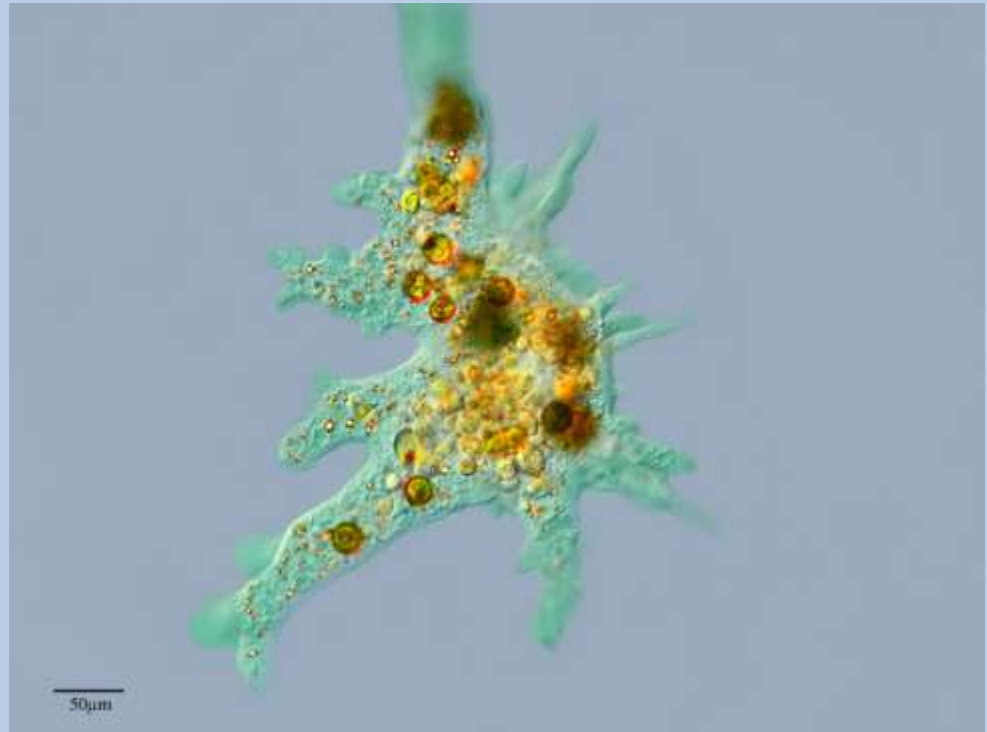
# Comparing Cell Structures

- Multicellular organisms maintain homeostasis because they have specialized cells



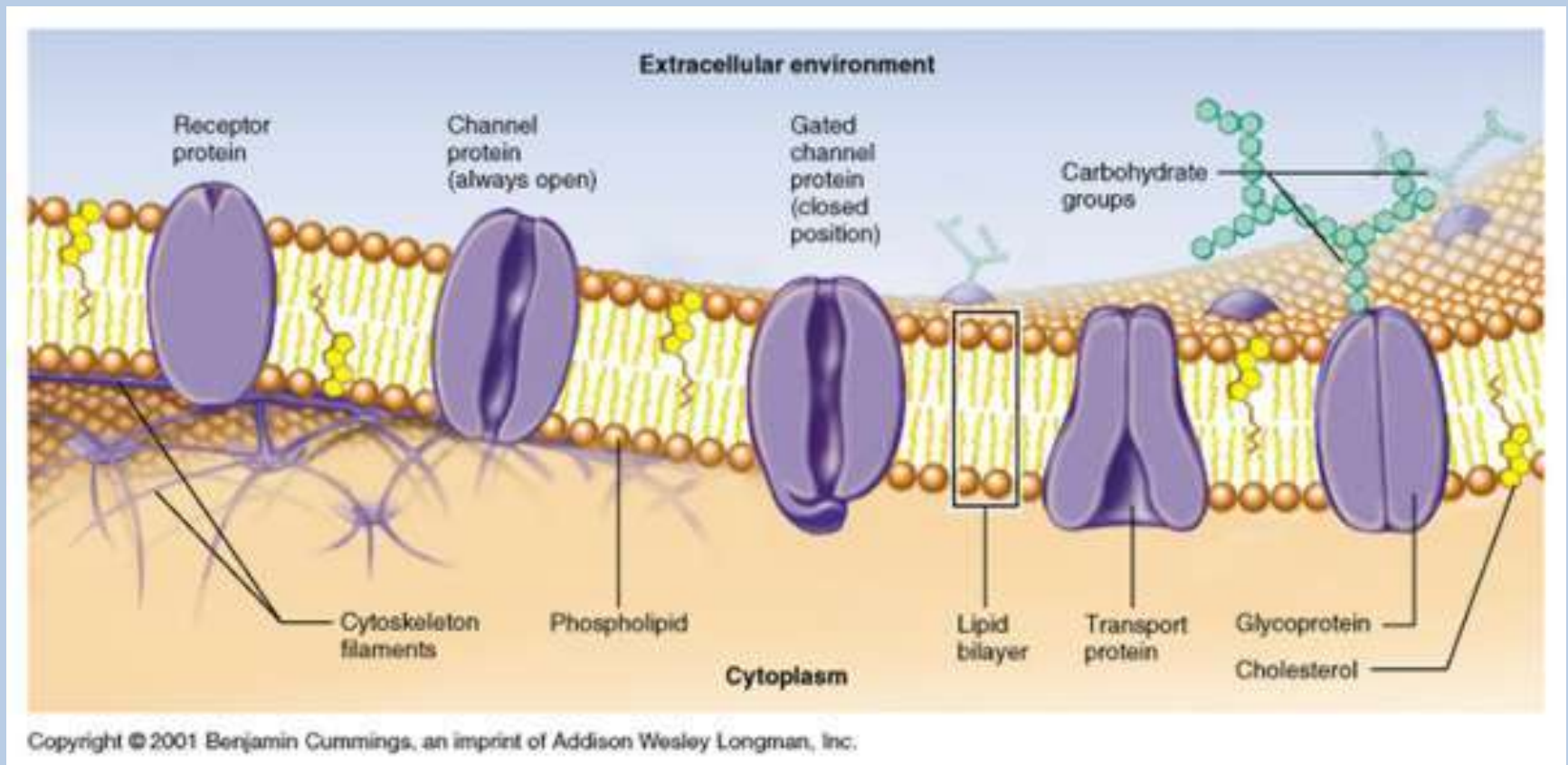
# Comparing Cell Structures

- Unicellular organisms maintain homeostasis because they have organelles



# Membranes and Molecules

- What is the structure of a cell membrane?



# Logistics

- **Get out the Interactivity:  
Multicellular Life**

# Logistics

- **Tape the Interactivity:  
Multicellular Life on top of page  
35**

# Comparing Cell Structures

- **WHEN YOU ARE DONE MAKE SURE YOUR NOTEBOOK IS CAUGHT UP:**

Page	Title of Page	Check	Page	Title of Page	Check
24	Yellowstone Ecosystem		25	Algae Lab	
26	Unit 2 Wrap-up		27	<b>Unit 3 Cover Sheet</b>	
28	5.3 Simulation: Investigate Population Growth		29	Demography Notes	
30	Ecological Footprints		31	Human Causes of Global Change	
32	Human Impact Project		33	<b>Unit 4 Cover Sheet</b>	
34	Cell Notes and 8.1 Interactivity		35	Comparative Cell Structure and 8.4 Interactivity	

# Egg-Mosis

- **Day 1 procedures**
- **BE CAREFUL; don't break your egg**

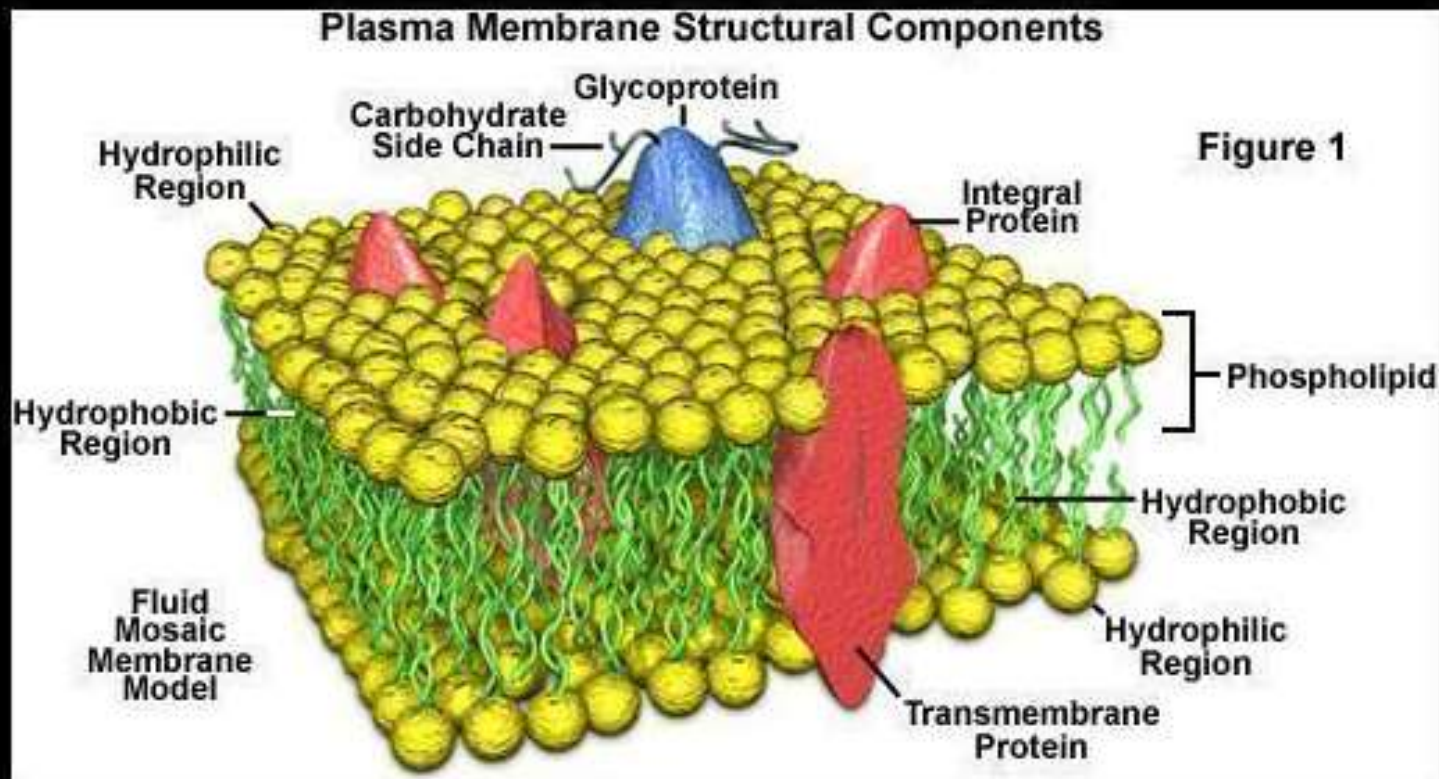


# Egg-Mosis

1. Grab a lab sheet
2. Measure your egg
3. Record measurements (*DON'T COMPLETE THE PRELAB*)
4. Day 1 Procedures
  - Carefully slide your egg into the beaker
  - Pour just enough vinegar to cover the egg
  - Place at the back of your lab station
5. Go back to your seat

# Membranes and Molecules

- What is the structure of a cell membrane?

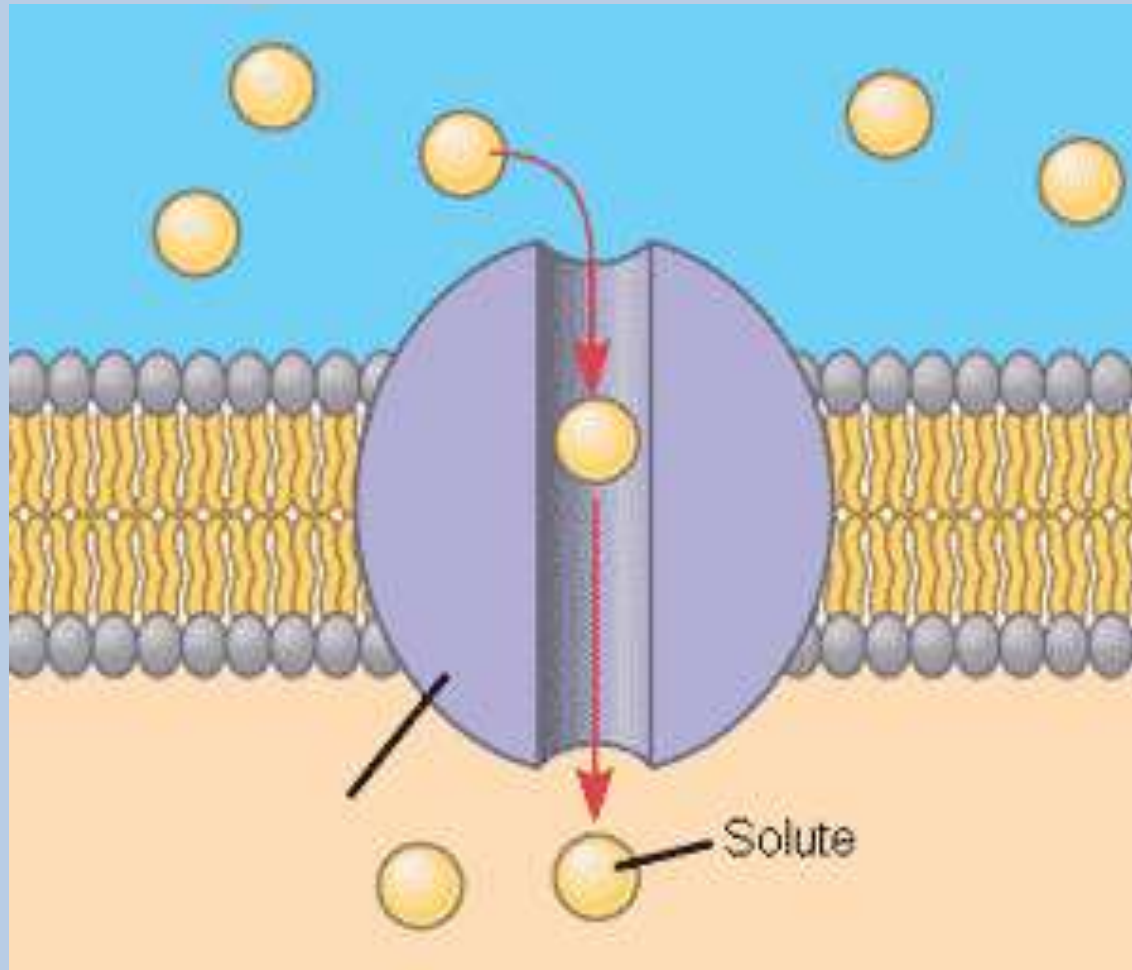


# Membranes and Molecules

- What is the structure of a cell membrane?

# Membranes and Molecules

- What do membrane proteins do?



# Membranes and Molecules

- What does selective mean?

# Membranes and Molecules

- What does permeable mean?

# Membranes and Molecules

- What does selective permeability mean?

# Membranes and Molecules

- Cell membranes are *selectively permeable*; they only let certain molecules pass through





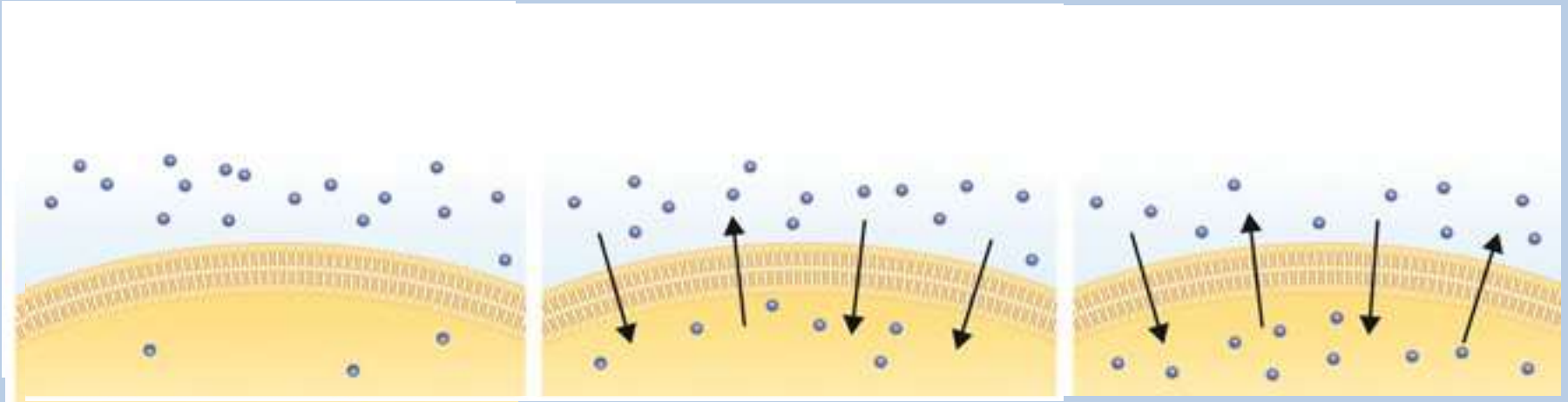
# Brain Break

- **Discuss with your group (1 min):**
  1. **What are 3 important facts about the cell membrane?**
- ***Write: 1-2 summary sentences about what you have learned***

# Membranes and Molecules

- **There are a few different processes that allow large or polar molecules to pass through membranes**

# Passive Transport



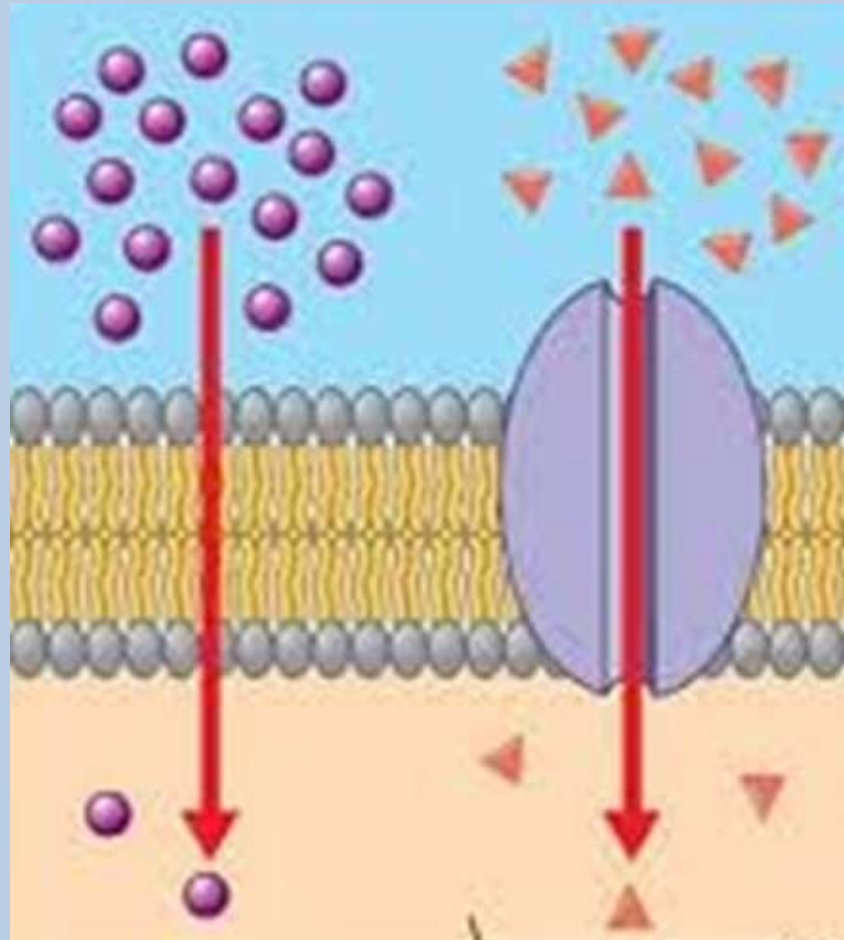
**Higher concentration of solute on one side of the membrane than the other**

***Diffusion* causes net movement of solute particles from the side of the membrane with the higher solute concentration to the side with the lower solute concentration.**

**At equilibrium, particles move equally in both directions, so there is no net change.**

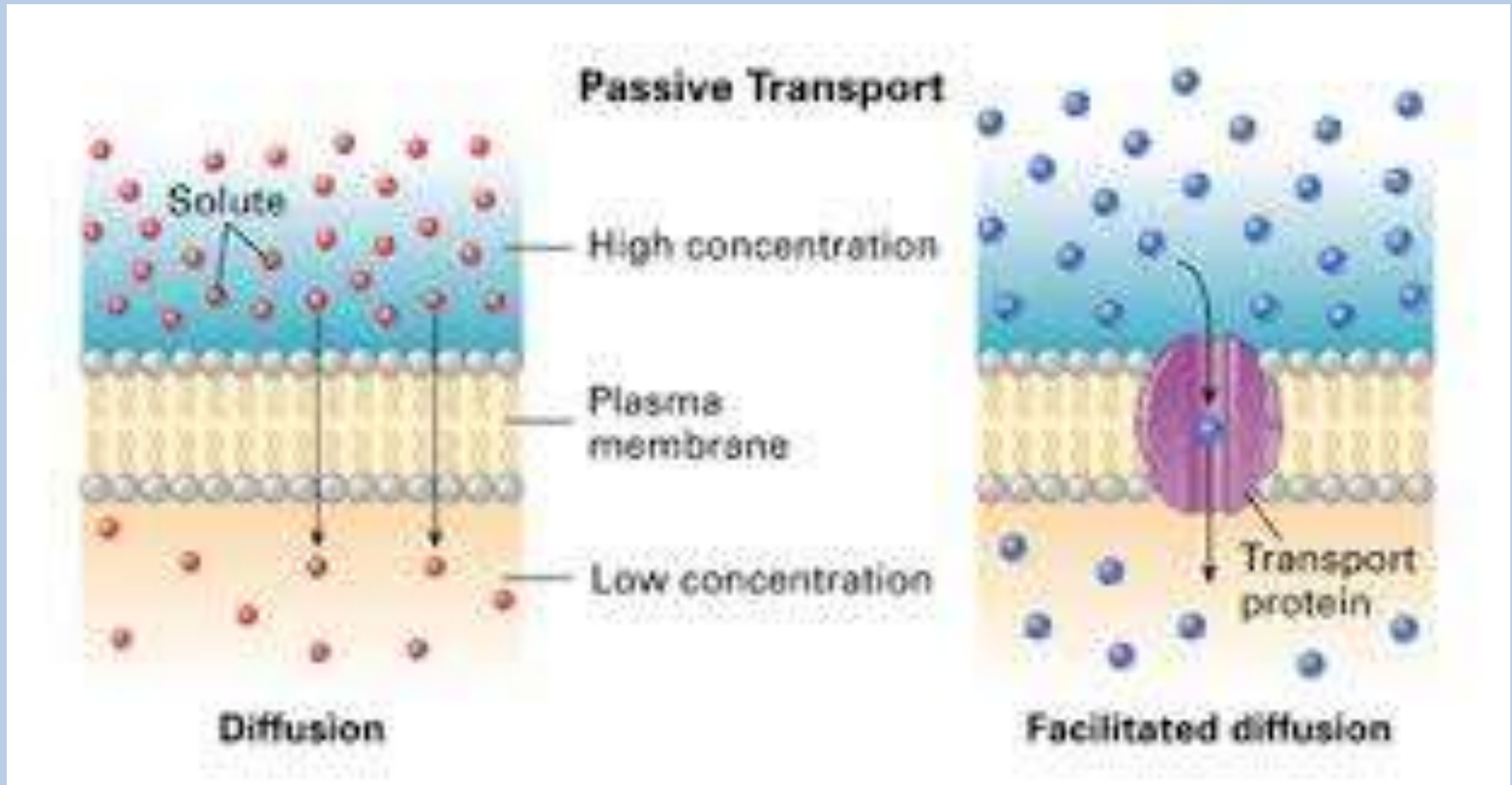
# Membranes and Molecules

- Compare

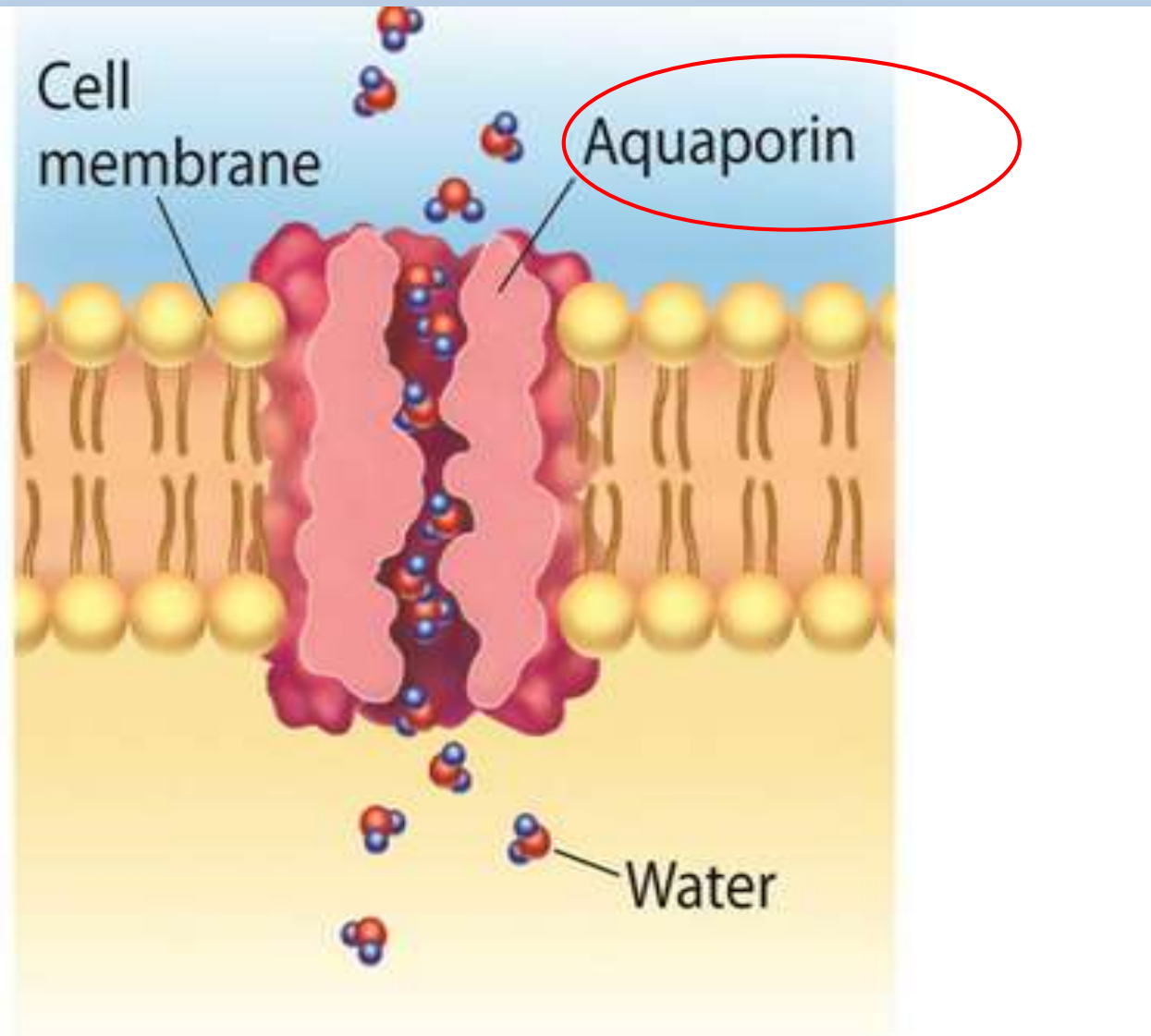


# Membranes and Molecules

- Compare

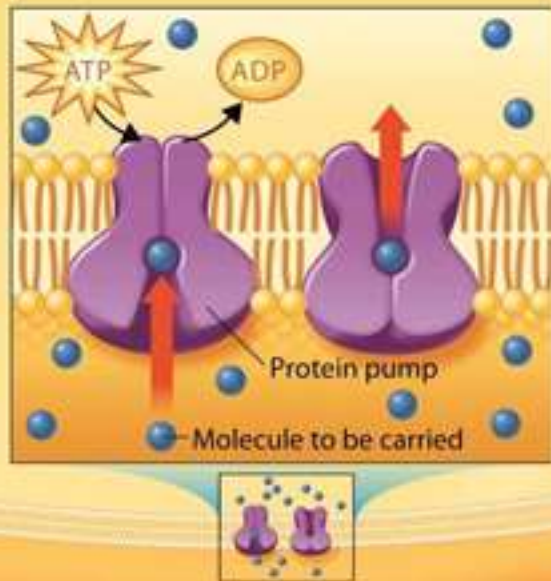


# Osmosis

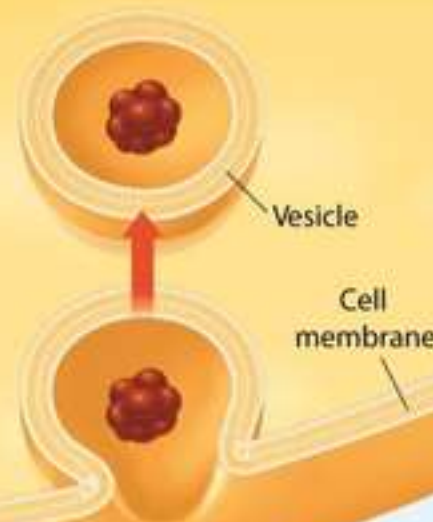


# Active Transport

Protein pumps



Endocytosis

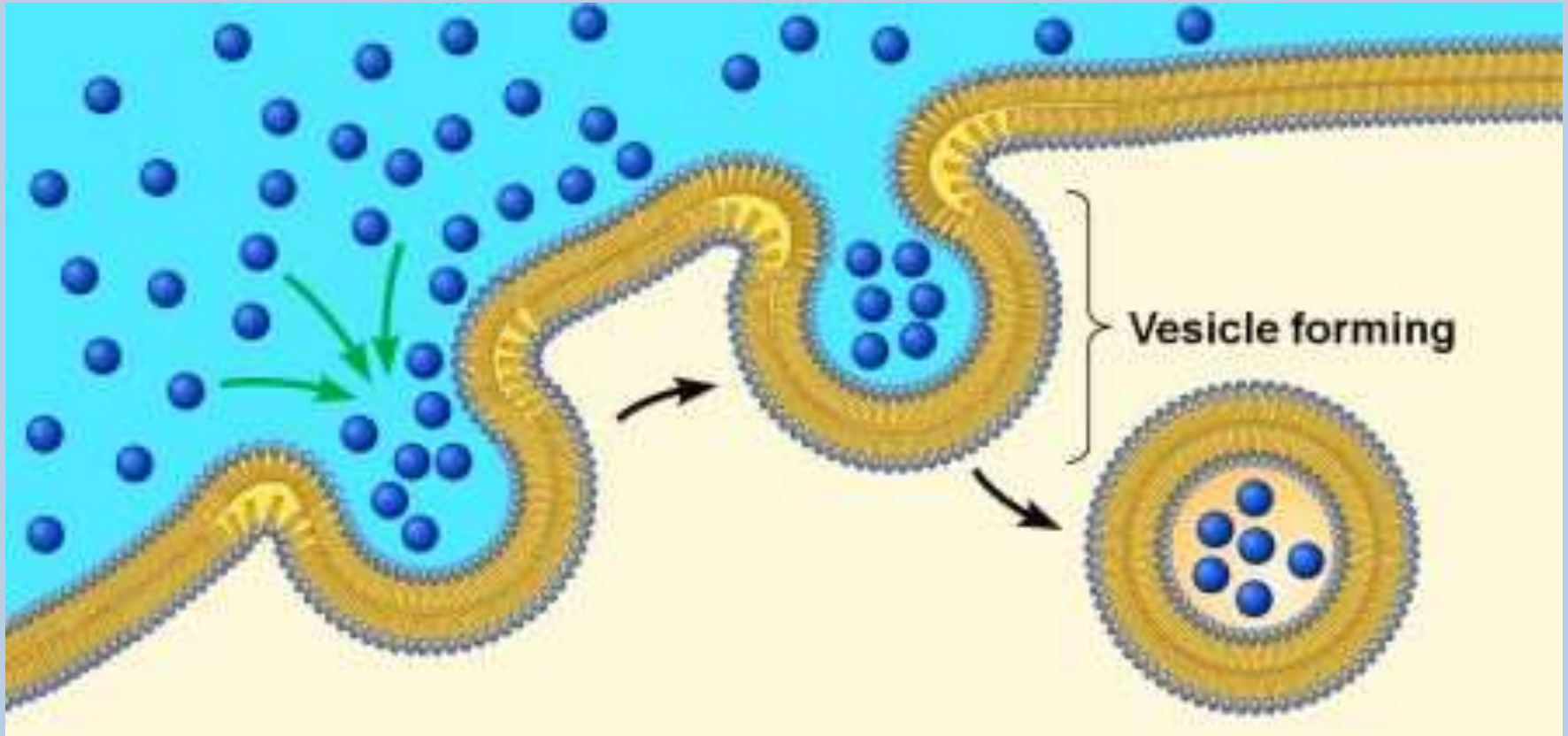


Exocytosis



# Membranes and Molecules

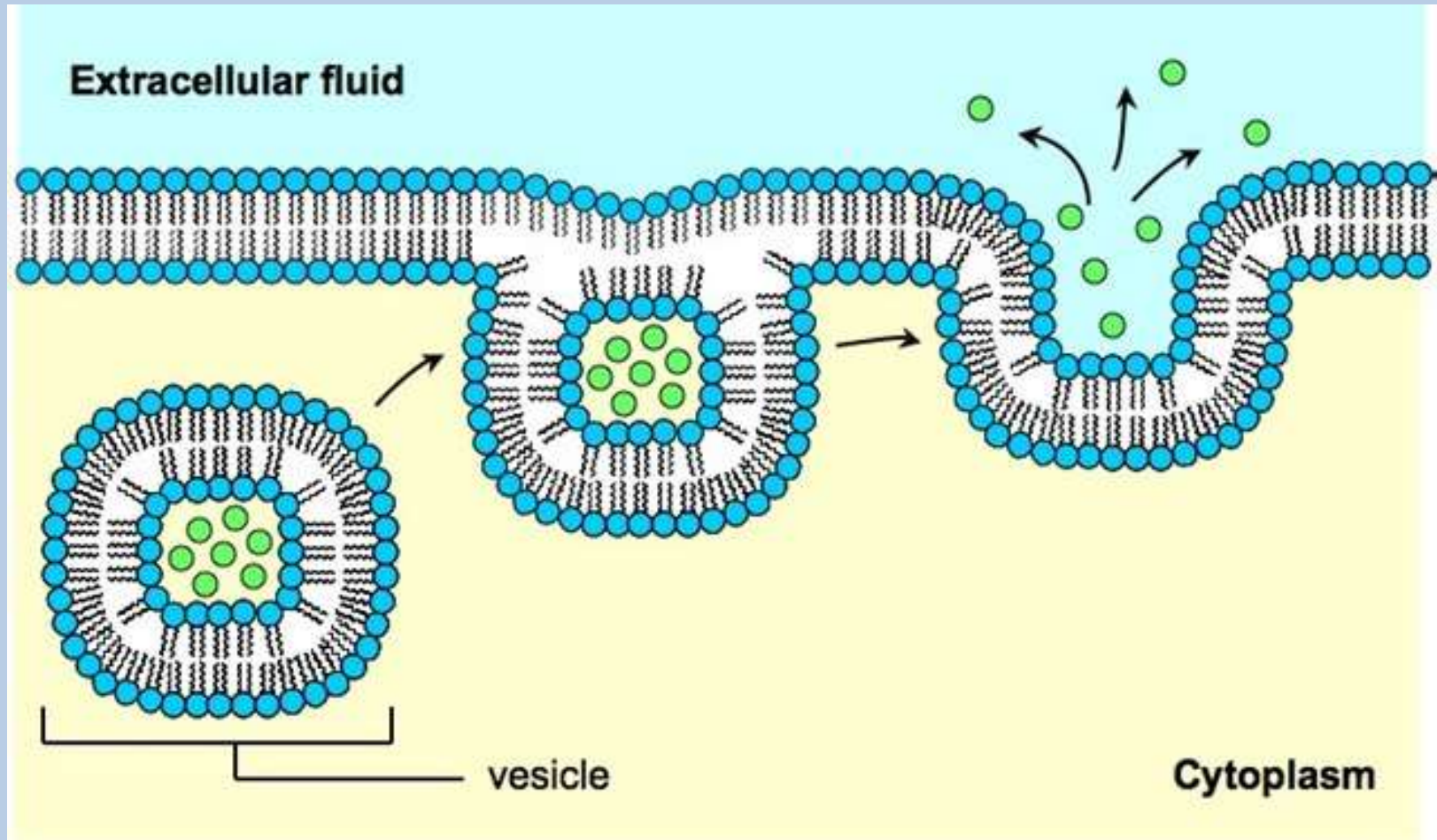
- Endocytosis





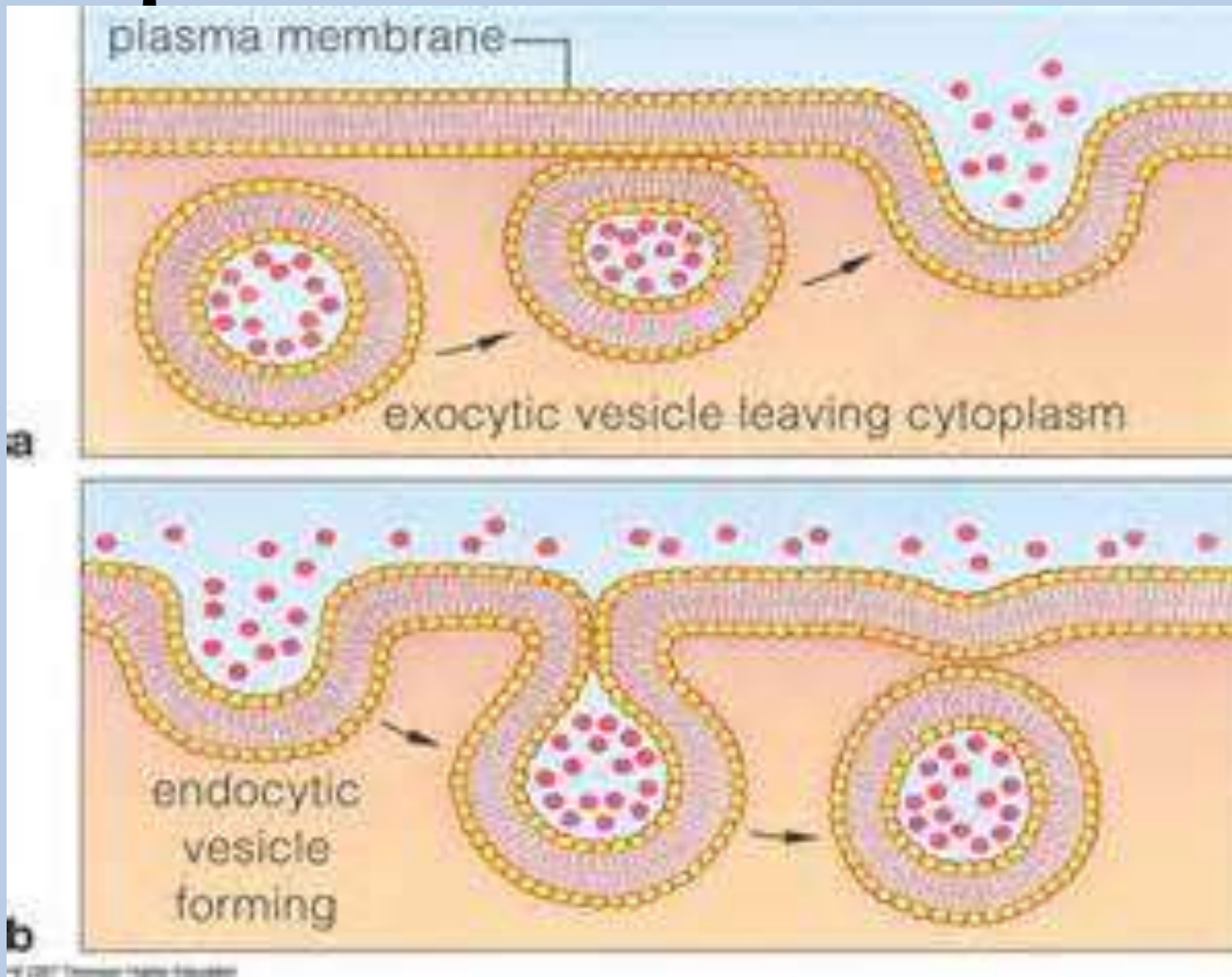
# Membranes and Molecules

- Exocytosis



# Membranes and Molecules

- Compare



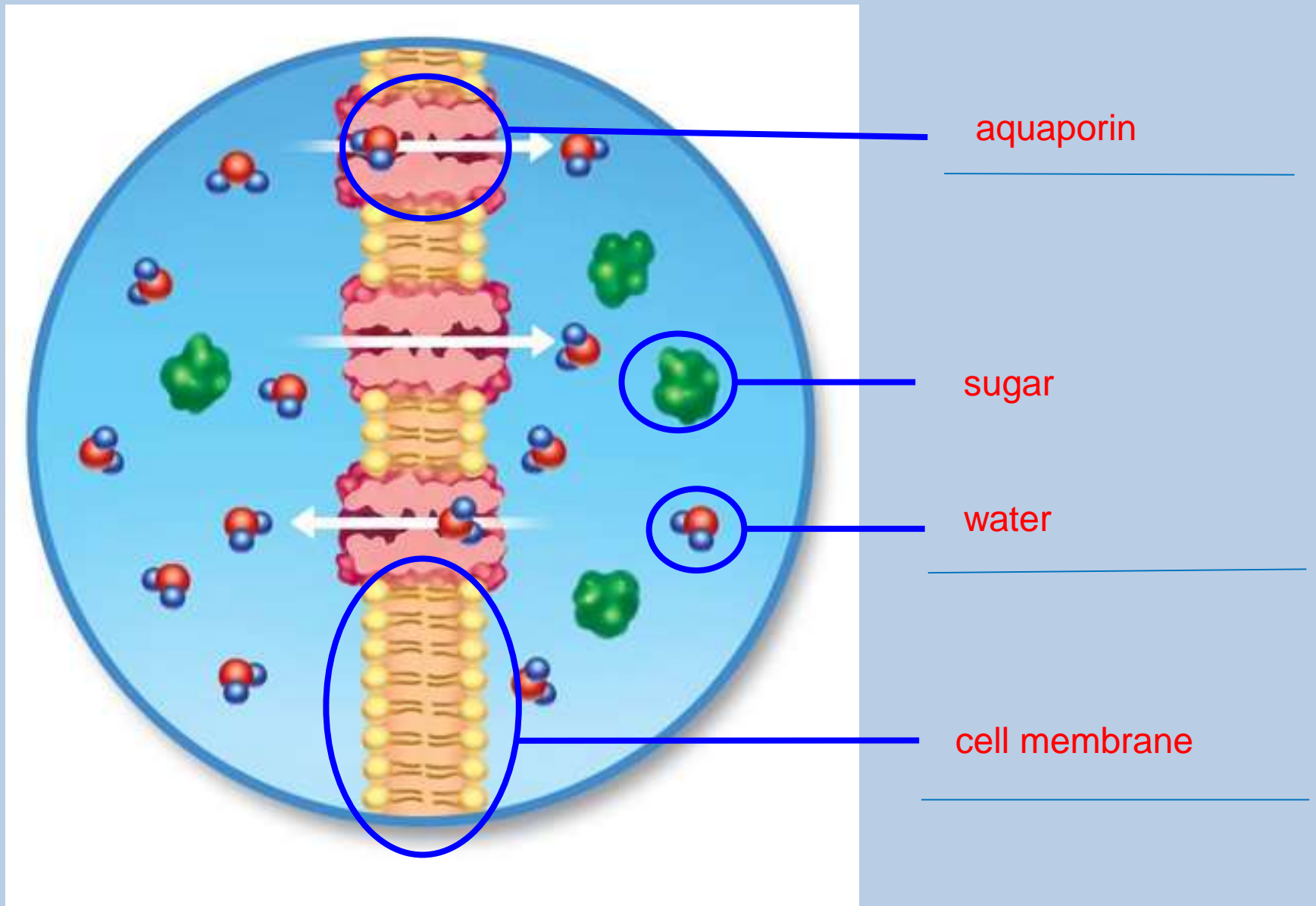
# Membranes and Molecules

- **Animation:**
- <http://highered.mheducation.com/olc/dl/120068/bio02.swf>

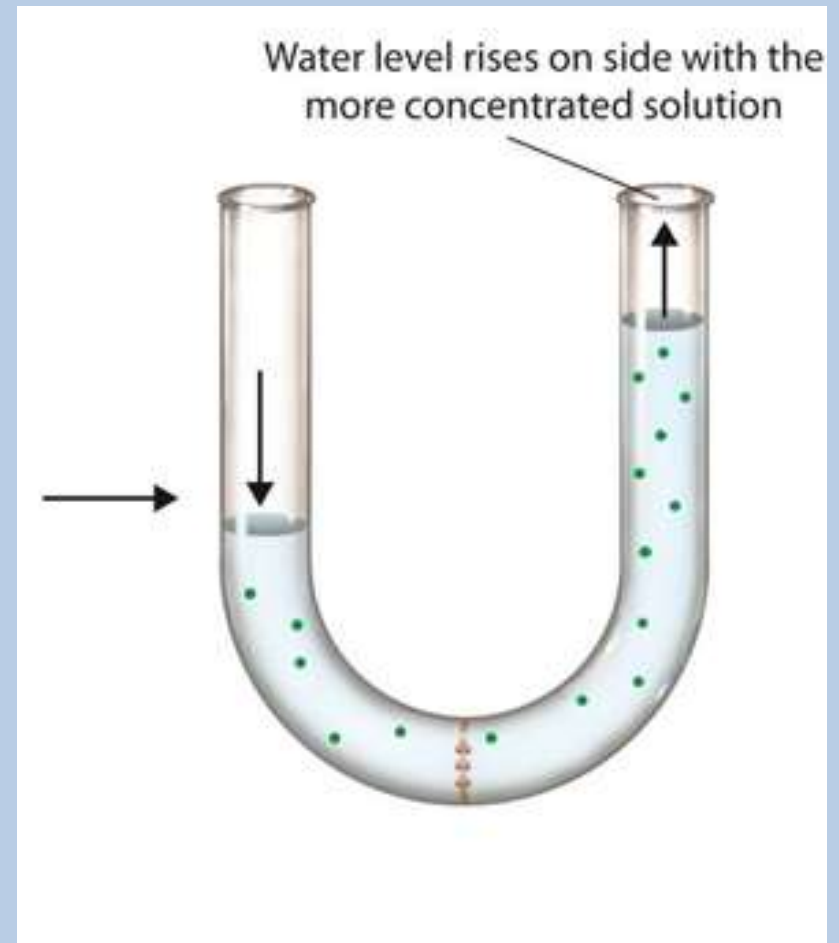
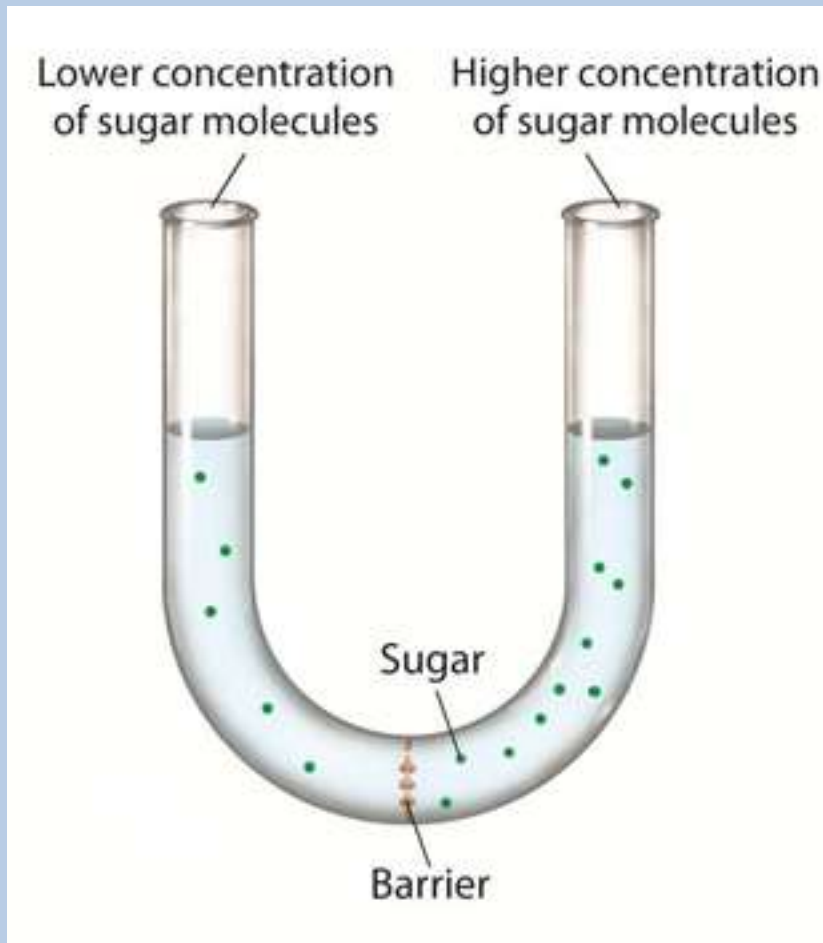
# Brain Break

- Discuss with your group (1 min):
  1. What is the difference between passive and active transport?
  2. What is the difference between diffusion, facilitated diffusion, and osmosis?
  3. What is the difference between endocytosis and exocytosis?
- *Write: 1-2 summary sentences about what you have learned since the last brain break*

# Passive Transport: Osmosis



# Osmosis



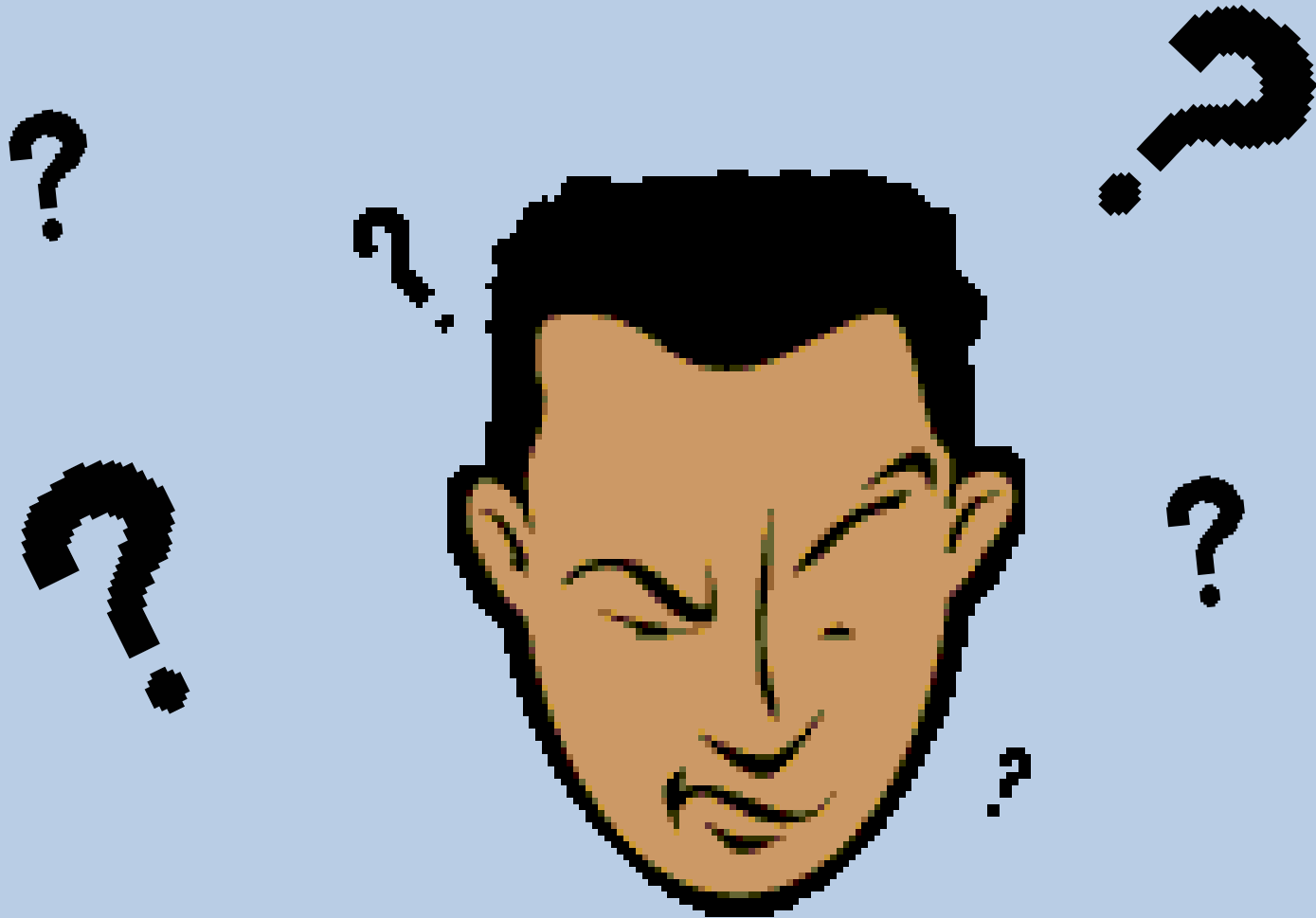
# Concentration

## IMPORTANT

- Transport describes WHICH molecules move
- Tonicity describes the DIRECTION that molecules will move

# Concentration

- What is concentration?





# Concentration

- **Concentration is the amount of molecules in a given area**

# Concentration

- **Concentration is the amount of molecules in a given area**
- **Solutes = molecules dissolved in water**
- **Solution = water with dissolved molecules**

# Concentration

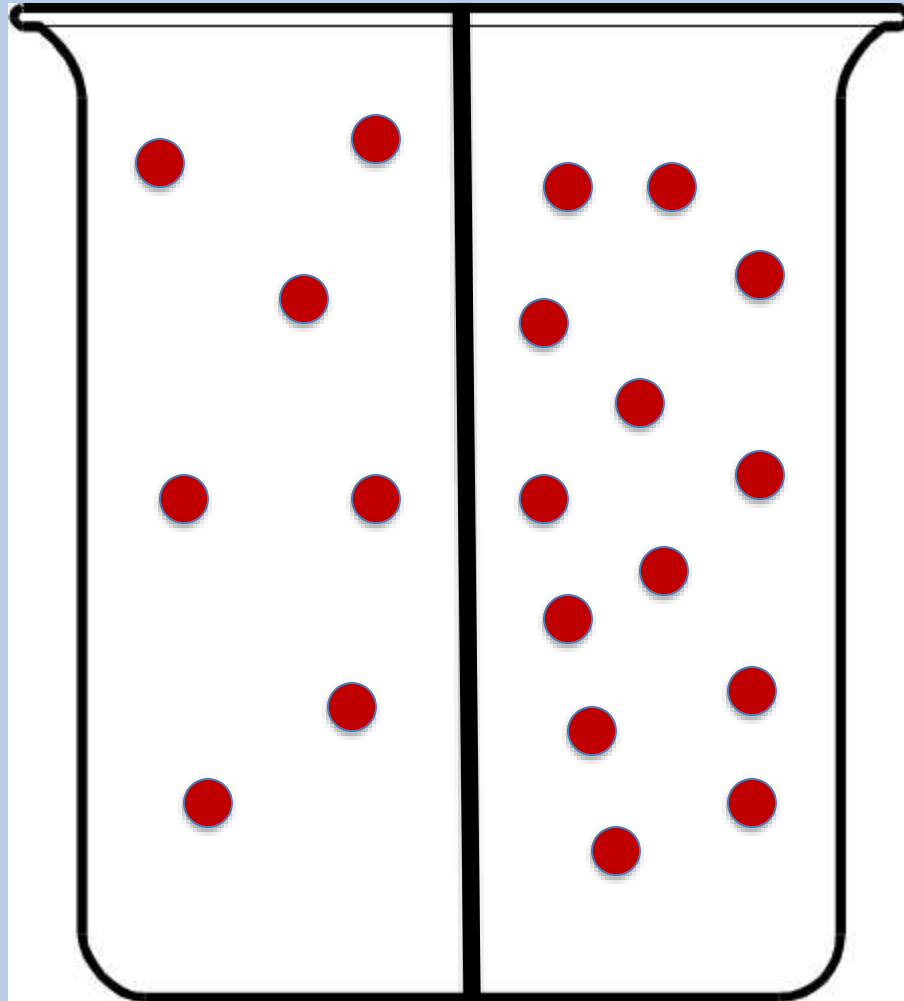
- Another way to indicate concentration is with brackets:
- $[\text{NaCl}]$  = concentration of salt

# Concentration

- If there are **MORE** molecules there is a **HIGHER** concentration
- If there are **LESS** molecules there is a **LOWER** concentration

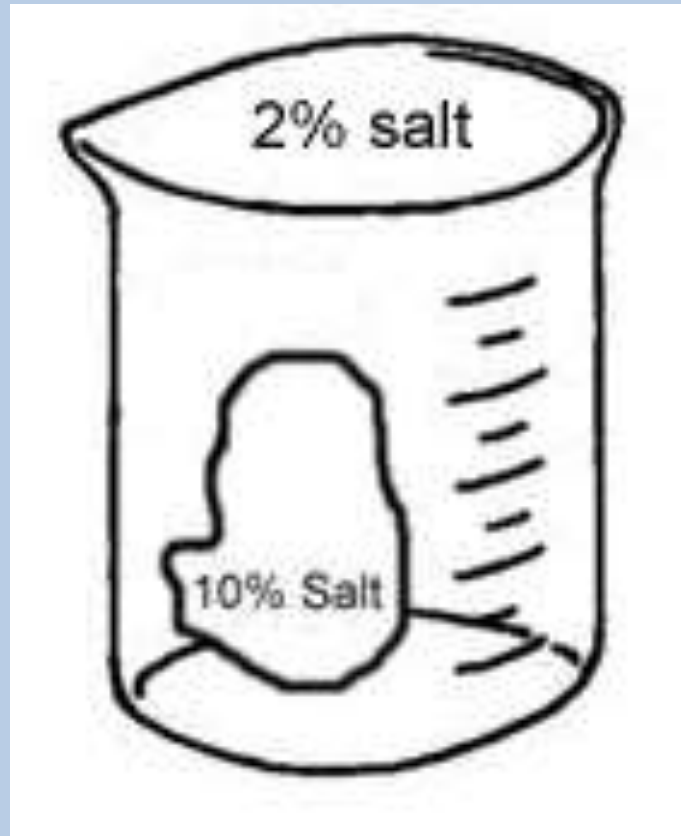
# Concentration - Tonicity

- Example



# Concentration

- Example



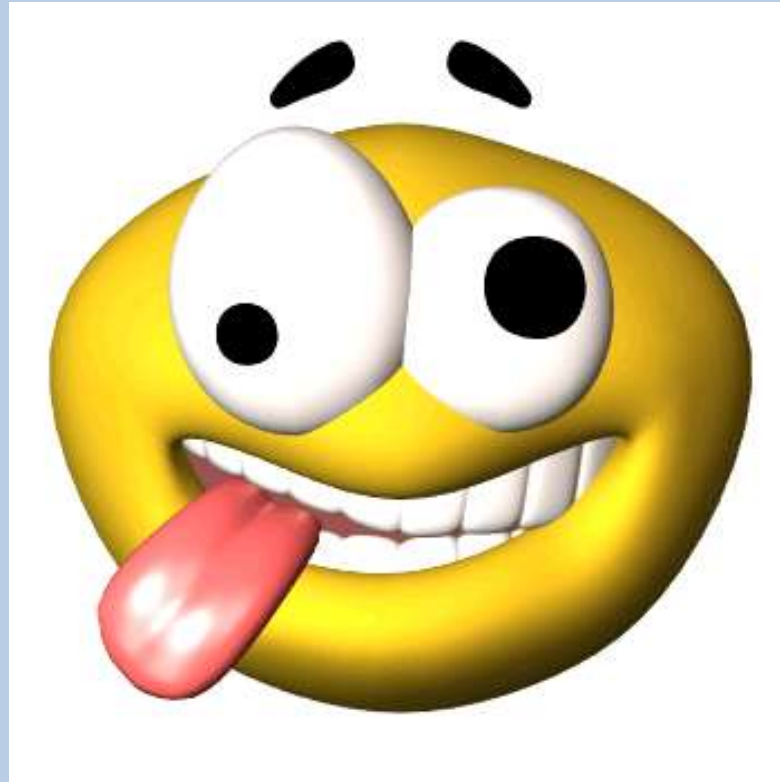
# Concentration

- Example



# Concentration

- **What does it mean when you are hyper?**





# Concentration - Tonicity

- **HYPERtonic** means that there is a **HIGHER** solute concentration (more stuff)

# Concentration - Tonicity

- What does Hypo- mean? (Think HYPOTHERMIA)

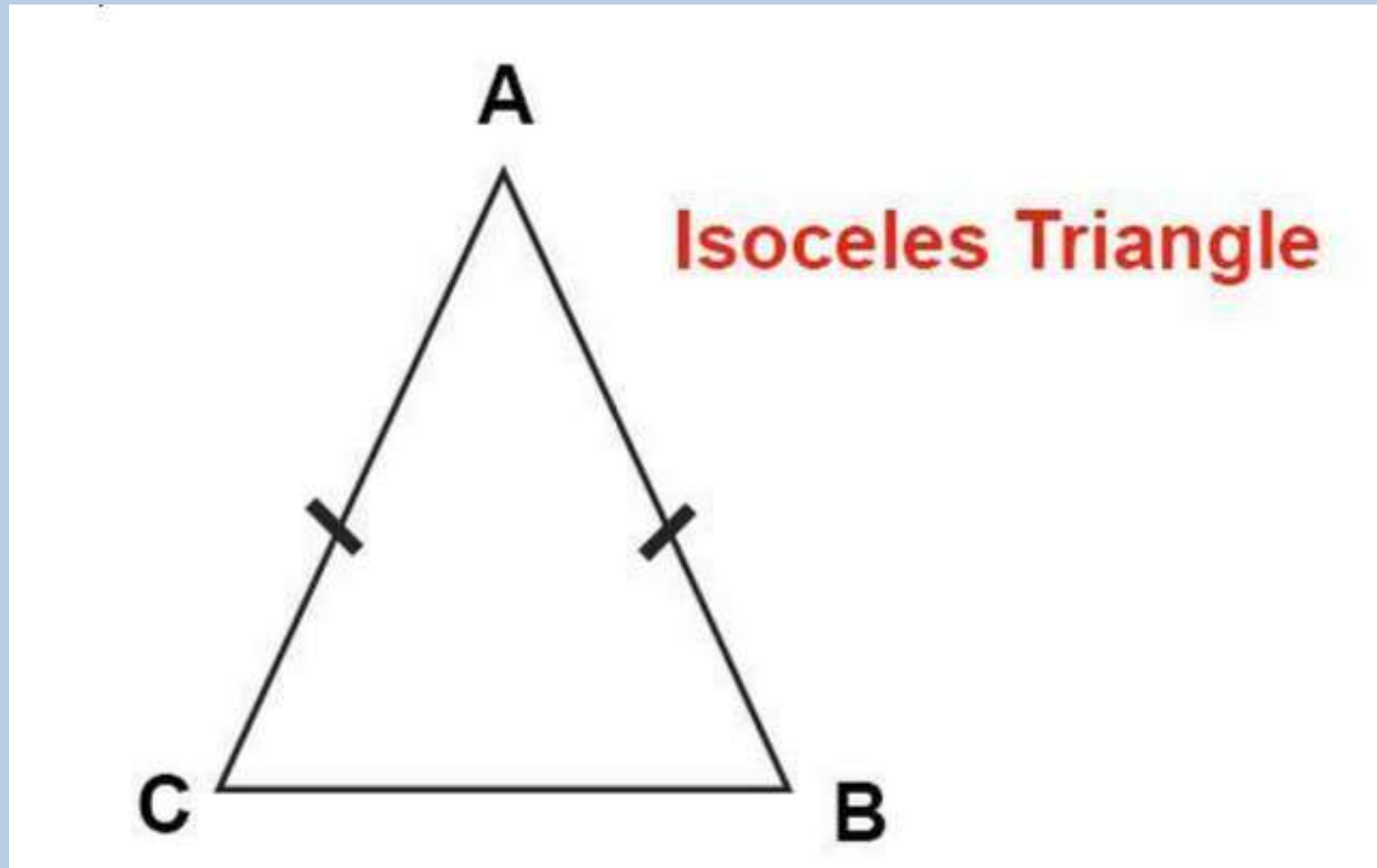


# Concentration - Tonicity

- **HYPOtonic** means that there is a **LOWER** solute concentration (less stuff)

# Concentration - Tonicity

- What does ISO- mean?

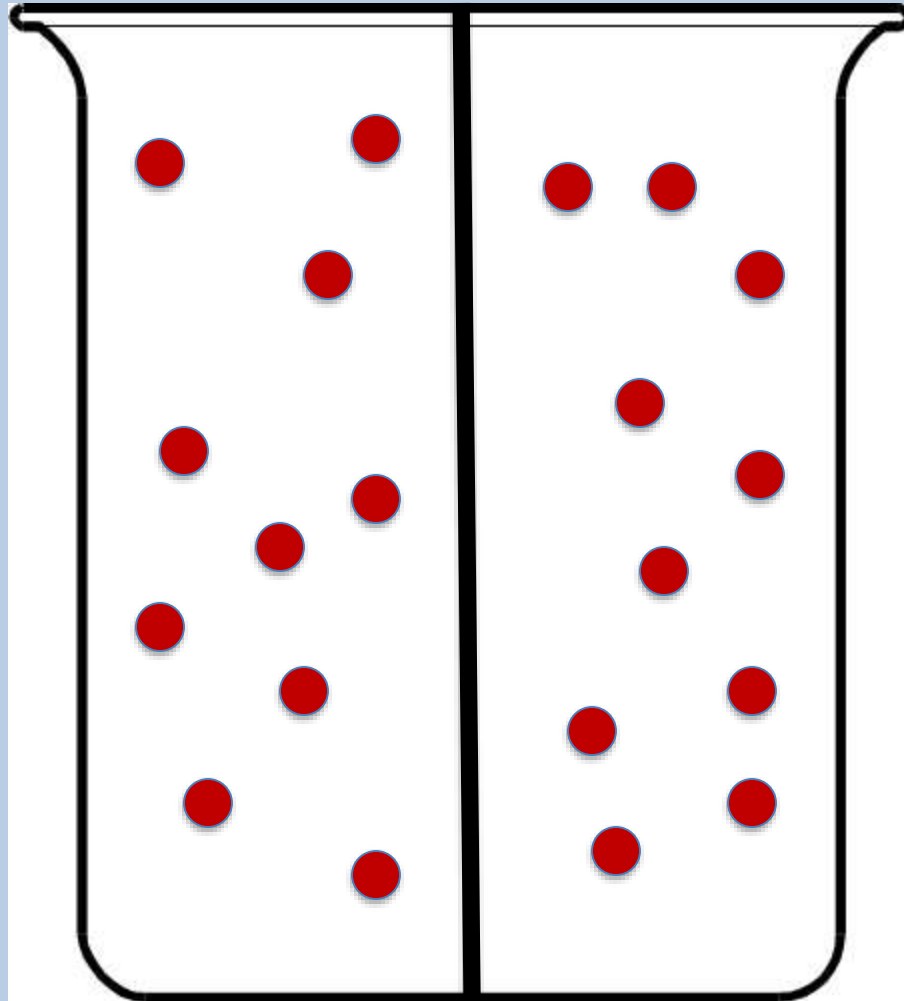


# Concentration - Tonicity

- **ISOtonic** means that there are **EQUAL** solute concentrations

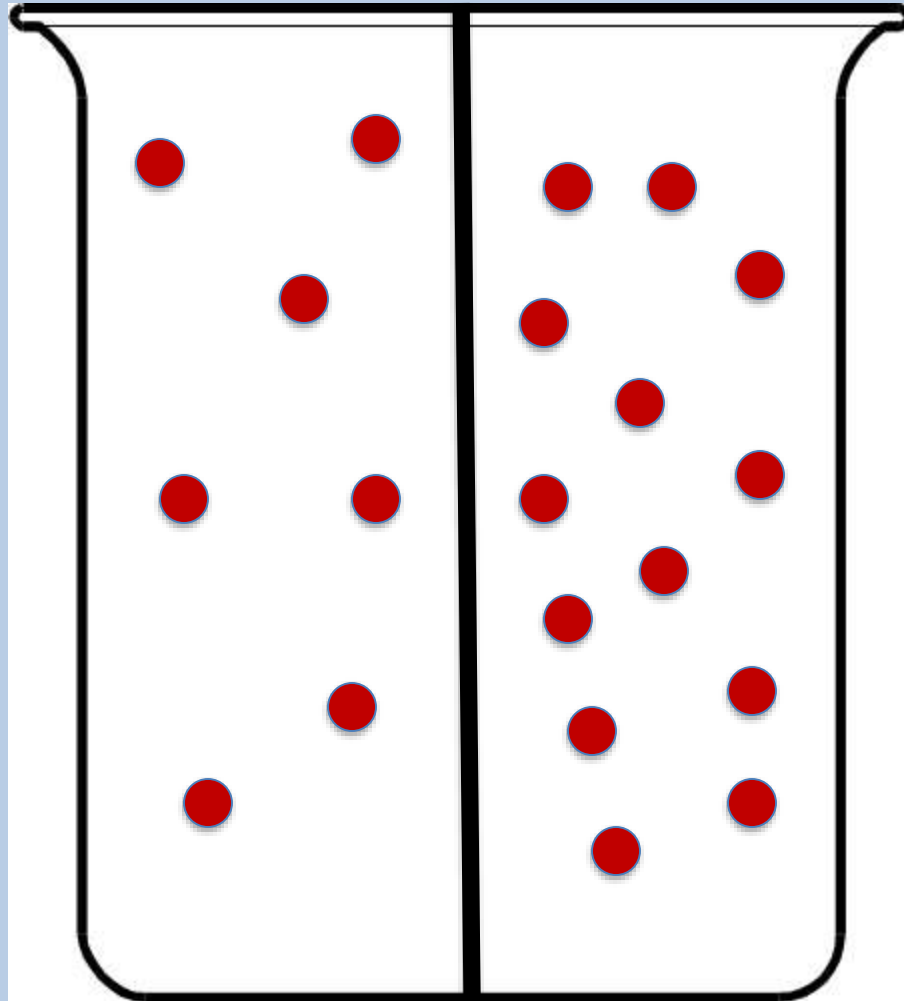
# Concentration - Tonicity

- Example



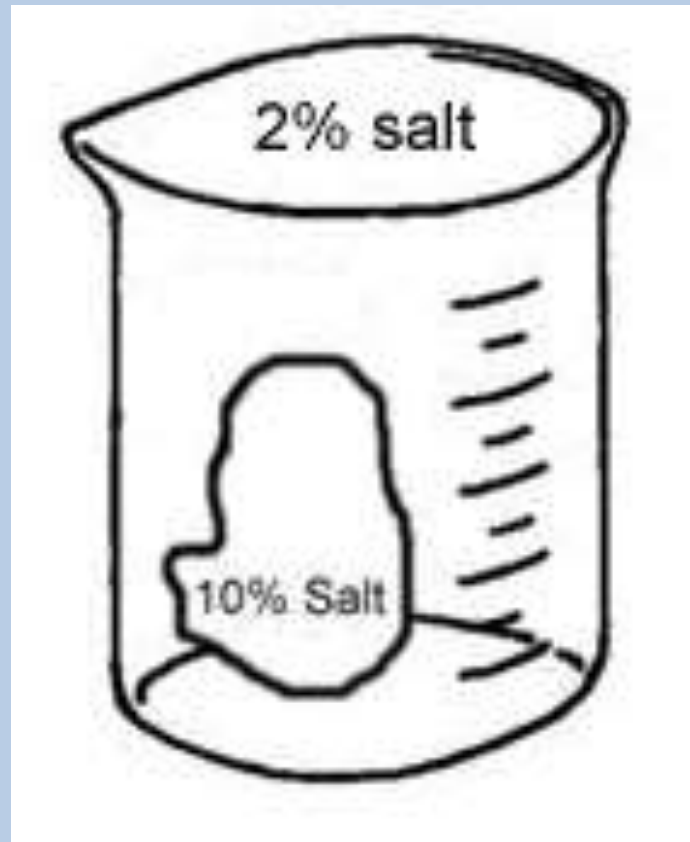
# Concentration - Tonicity

- Example



# Concentration -Tonicity

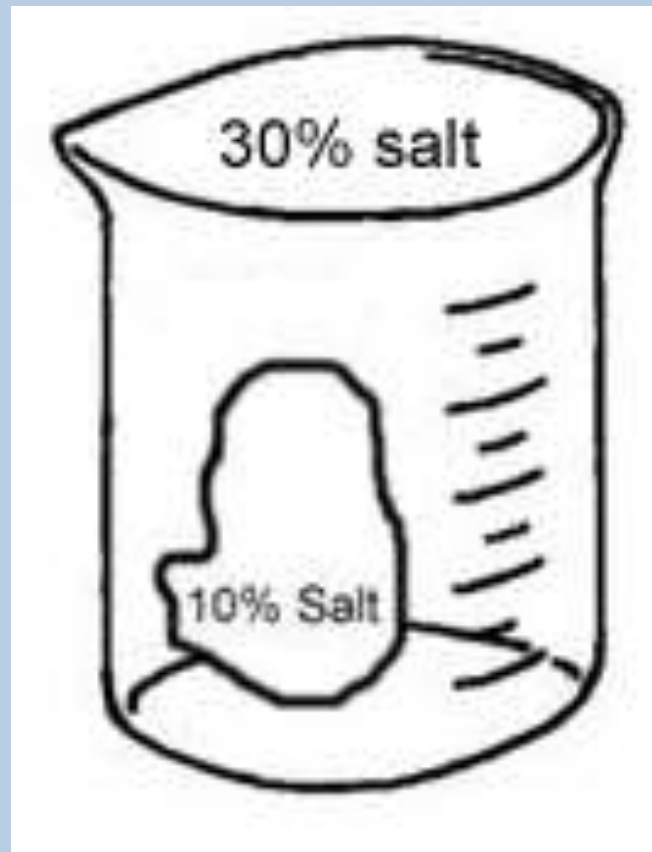
- Example





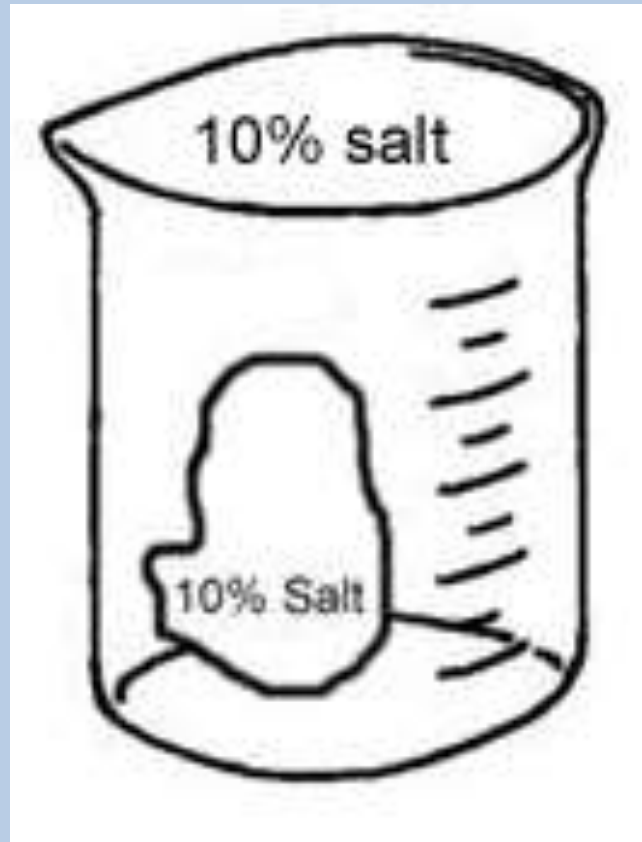
# Concentration - Tonicity

- Example



# Concentration - Tonicity

- Example

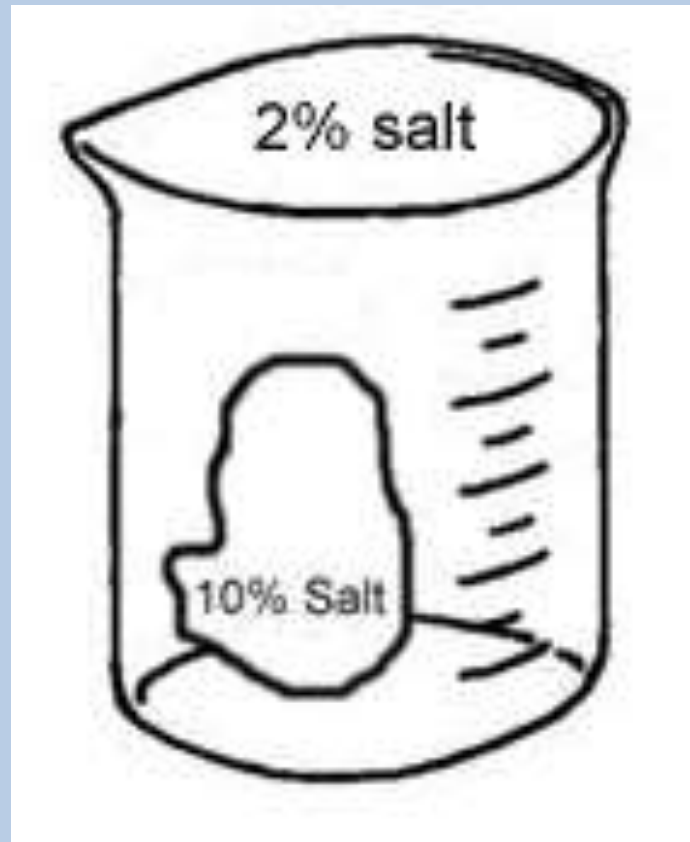


# Concentration

- When concentrations are different between 2 solutions separated by a membrane we call the difference between them a **CONCENTRATION GRADIENT**

# Concentration -Tonicity

- Example



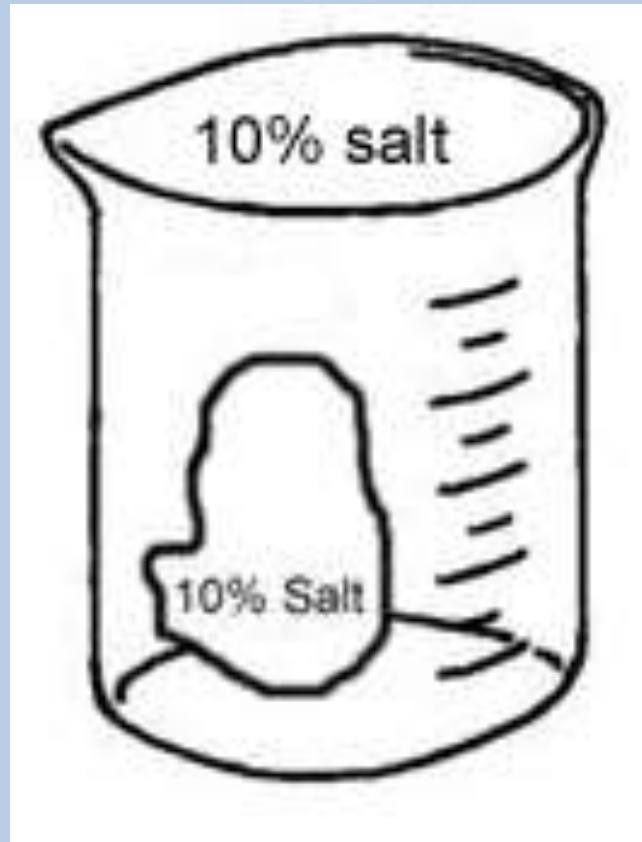
# Concentration - Tonicity

- Example

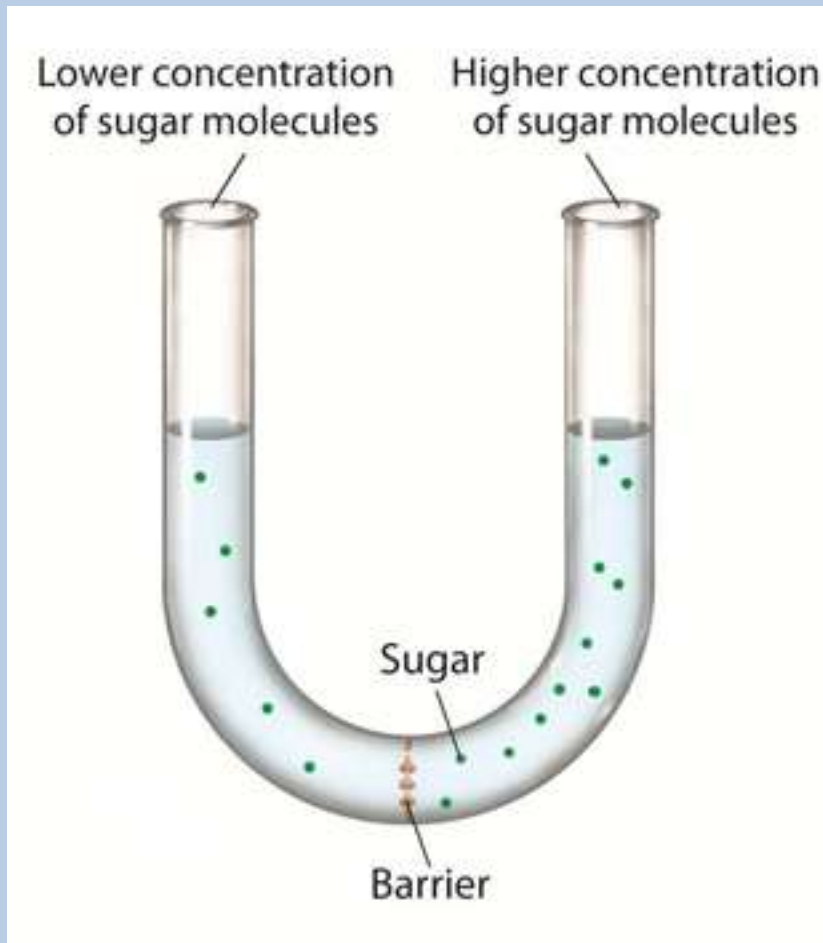


# Concentration - Tonicity

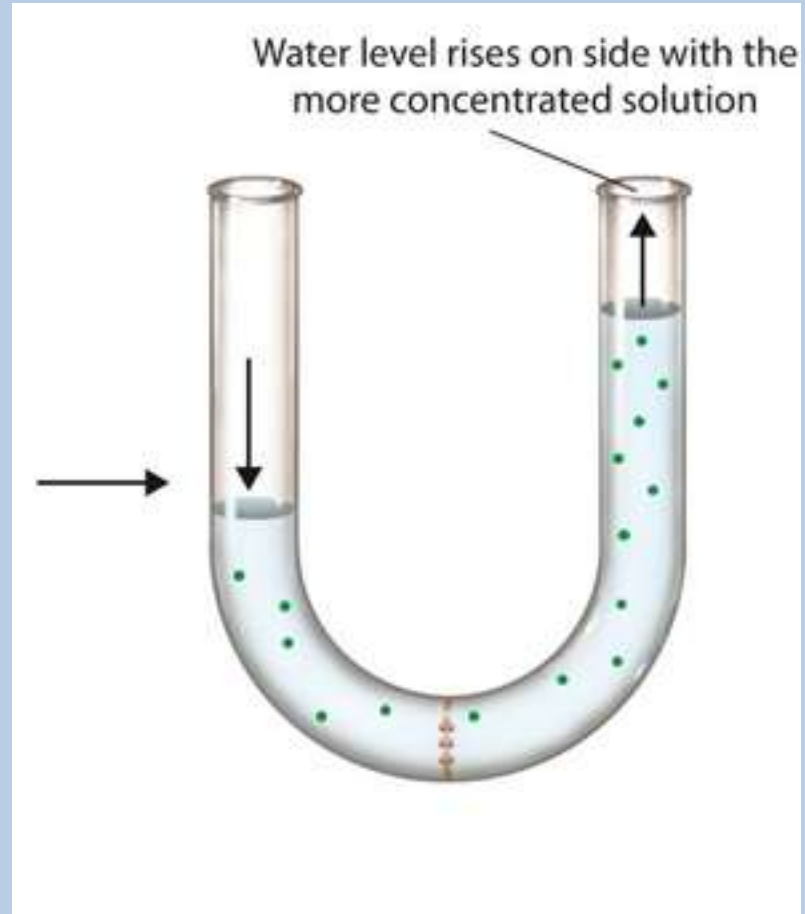
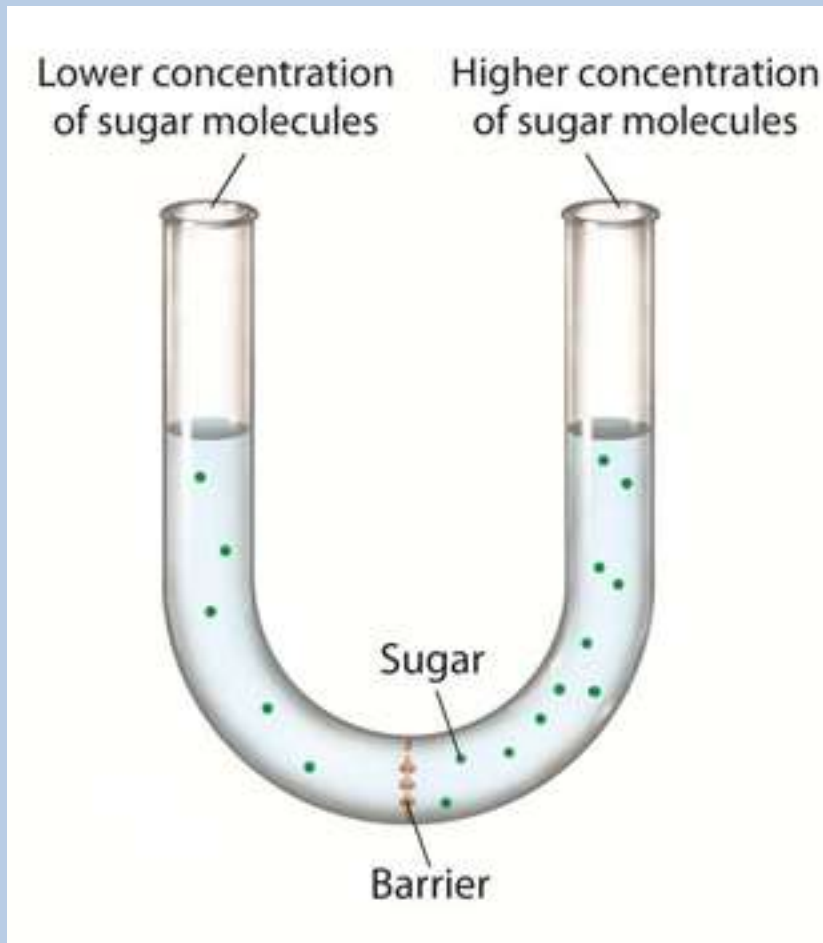
- Example



# Osmosis



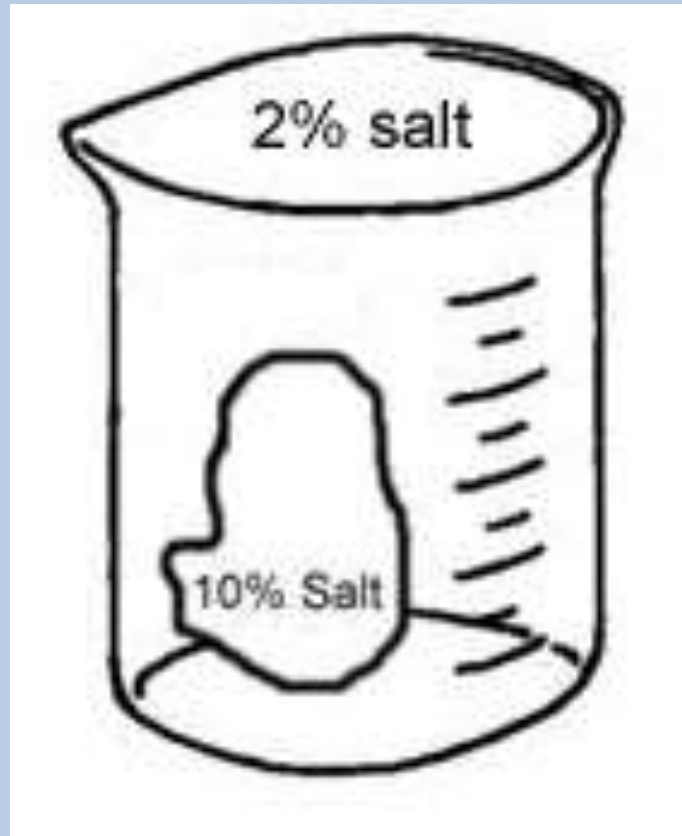
# Osmosis





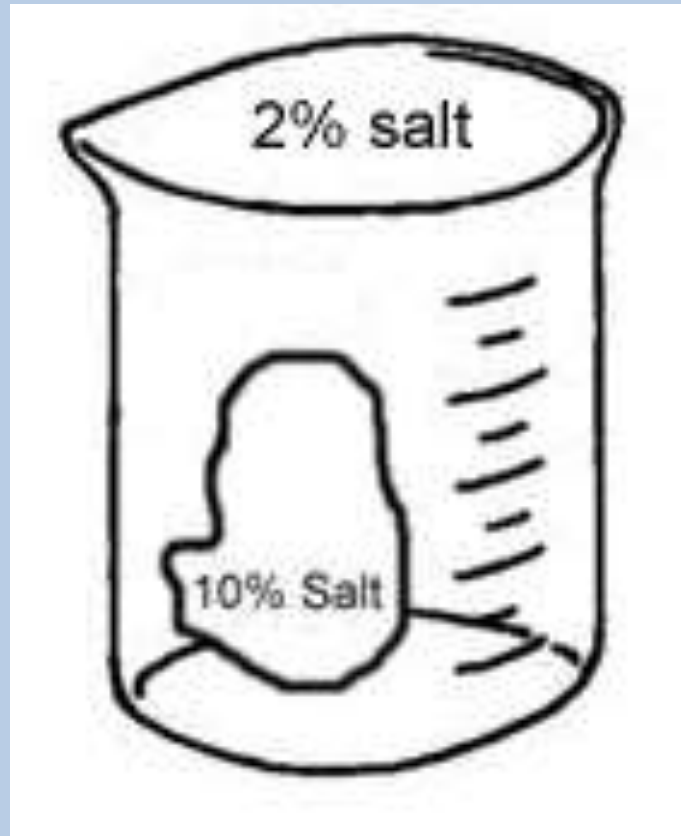
# Concentration

- Which way will water move? Into or out of the membrane?



# Concentration

- If the concentration gradient is large enough the cell could burst



# Concentration

- **CYTOLYSIS:** water enters a cell due to osmosis and the cell bursts



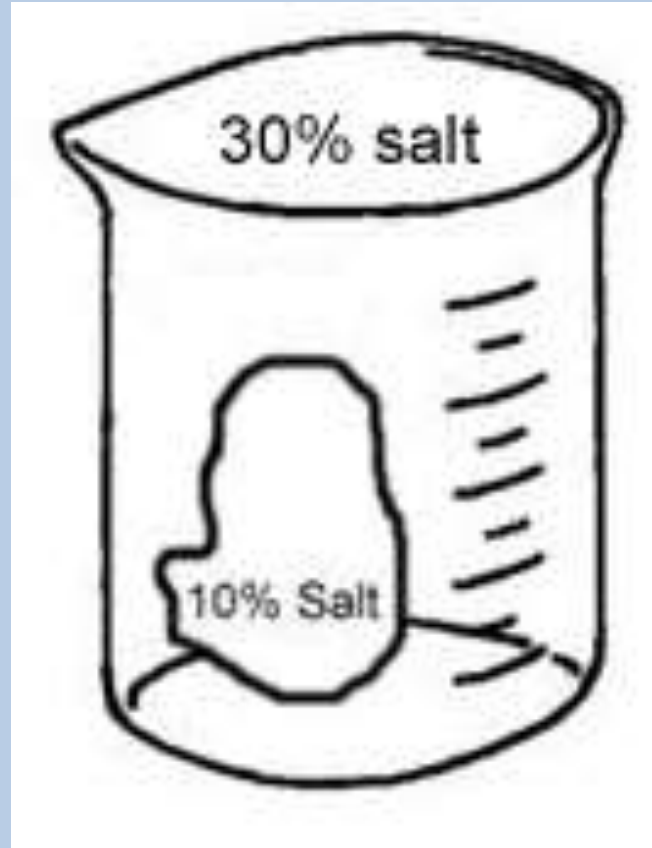
# Concentration

- Which way will water move? Into or out of the membrane?



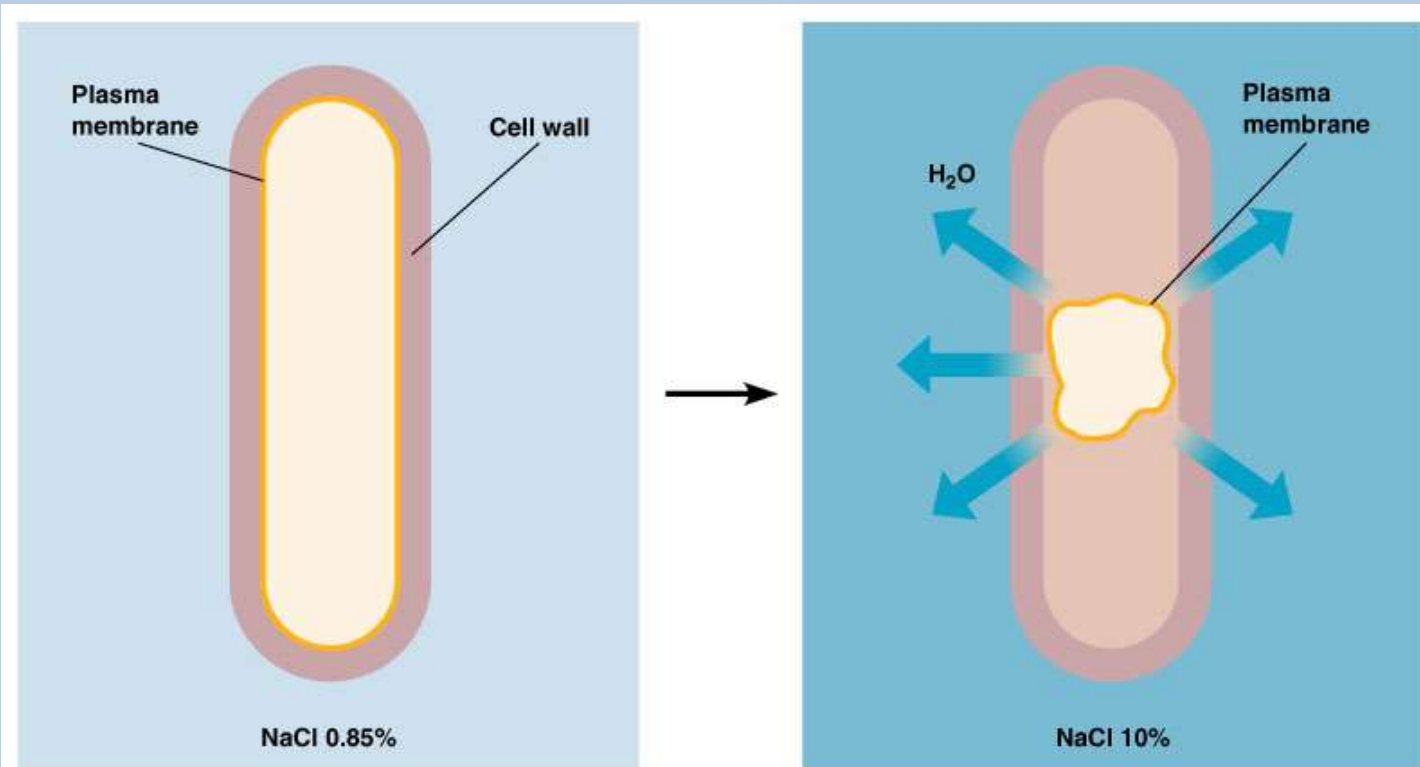
# Concentration

- If the concentration gradient is large enough the cell could shrink



# Concentration

- **PLASMOLYSIS: cell shrinks**



**(a) Normal cell in isotonic solution.**  
Under these conditions, the osmotic pressure in the cell is equivalent to a solution concentration of 0.85% sodium chloride (NaCl).

**(b) Plasmolyzed cell in hypertonic solution.**  
If the concentration of solutes such as NaCl is higher in the surrounding than in the cell (hypertonic), water tends to leave the cell. Growth of the cell is inhibited.

# Membranes and Molecules

- We are going to play a game.



# **Membranes and Molecules**

- **You will be divided into six groups**



# Membranes and Molecules

- **During a group's turn they will be a cell membrane**
- **The other two groups will be molecules trying to pass through the membrane**

# Membranes and Molecules

- In order for a group to win two things must happen:
  1. The membrane enforces the rules **WITHOUT SPEAKING**
  2. The molecules can guess the rules by the end of the turn

# Membranes and Molecules

- **Groups:**
  - **Group 1, 3A and 3B**
  - **Group 2, and 3C**
  - **Group 4, and 3D**
  - **Group 8, and 6C**
  - **Group 7, 6A and 6B**
  - **Group 5, and 6D**