

NEVER
IS NOT A GIFT.
YOU
HAVE TO
EARN IT.

don't make
as the
important
ones we
do make.

is a matter of
CHOICE.

Periodic Table

D

You Can't Scare Me
* I'm A Teacher *



Flap 1

- * Label & Color
- cytoplasm (yellow)
- transport protein (2) (blue)

* Define each
under flap

Flap 2

- * Label & Color (green)
- glycolipids (green)
- peripheral proteins (purple)

* Define each
on inside

Flap 3

- * Label & Color
- Glycoprotein (dark green)
- surface protein (dark blue)

* Define each
on inside

Flap

* L

* -



make
important
ones we
do make.

ATTITUDE
is a matter of
CHOICE.

Only
POSITIVE
attitudes
allowed
beyond
this point.

You can
wait things
happen
or
you
can
make things
happen.
If you think nobody cares
Think
Again!

Flap 2

- * Label & Color
 - glycolipids (green)
 - peripheral proteins (purple)
- * Define each on inside

Flap 3

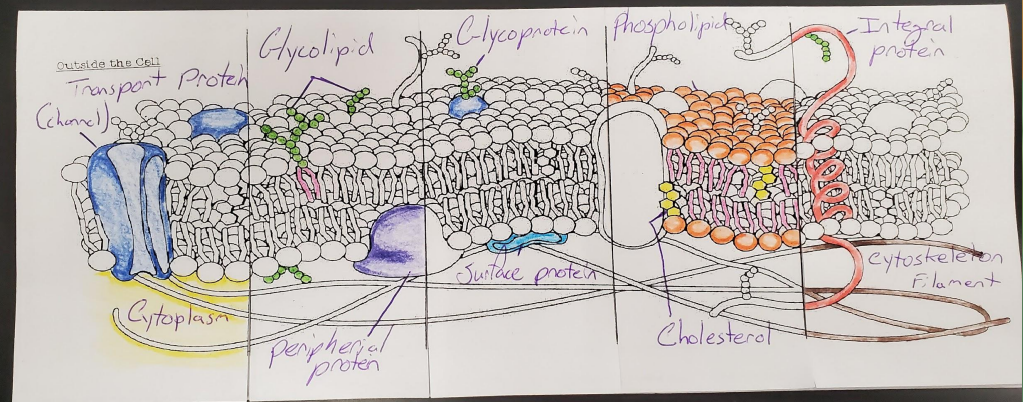
- * Label & Color
 - Glycoprotein (dark green)
 - surface protein (dark blue)
- * Define each on inside

Flap 4

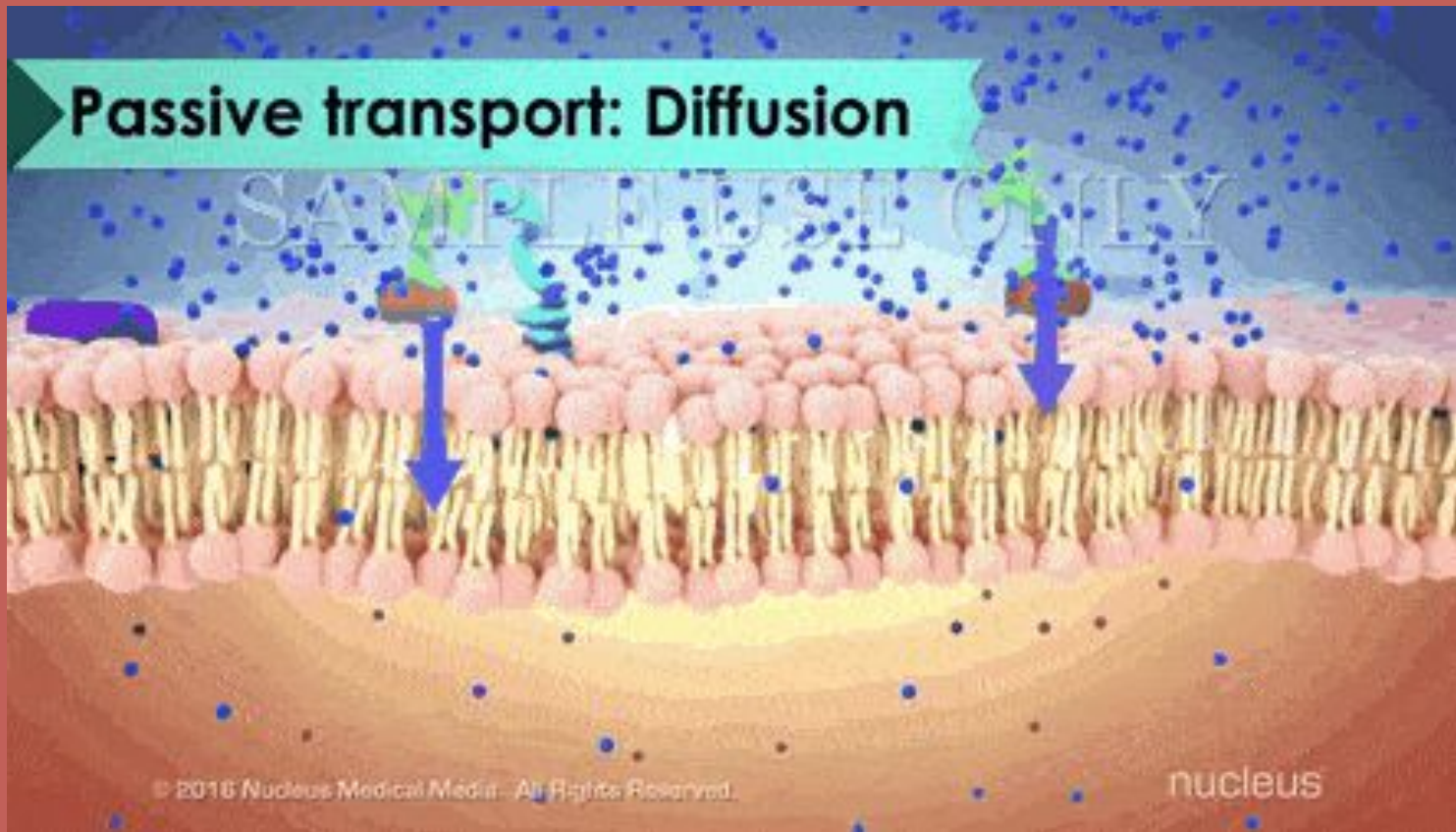
- * Label & Color
 - heads (all orange)
 - tails (all pink)
 - cholesterol (yellow)
 - phospholipid (black)
- * Define each on inside

Flap 5

- * Label & Color
 - integral protein (red)
 - cytoskeleton (brown)
- * Define each on inside



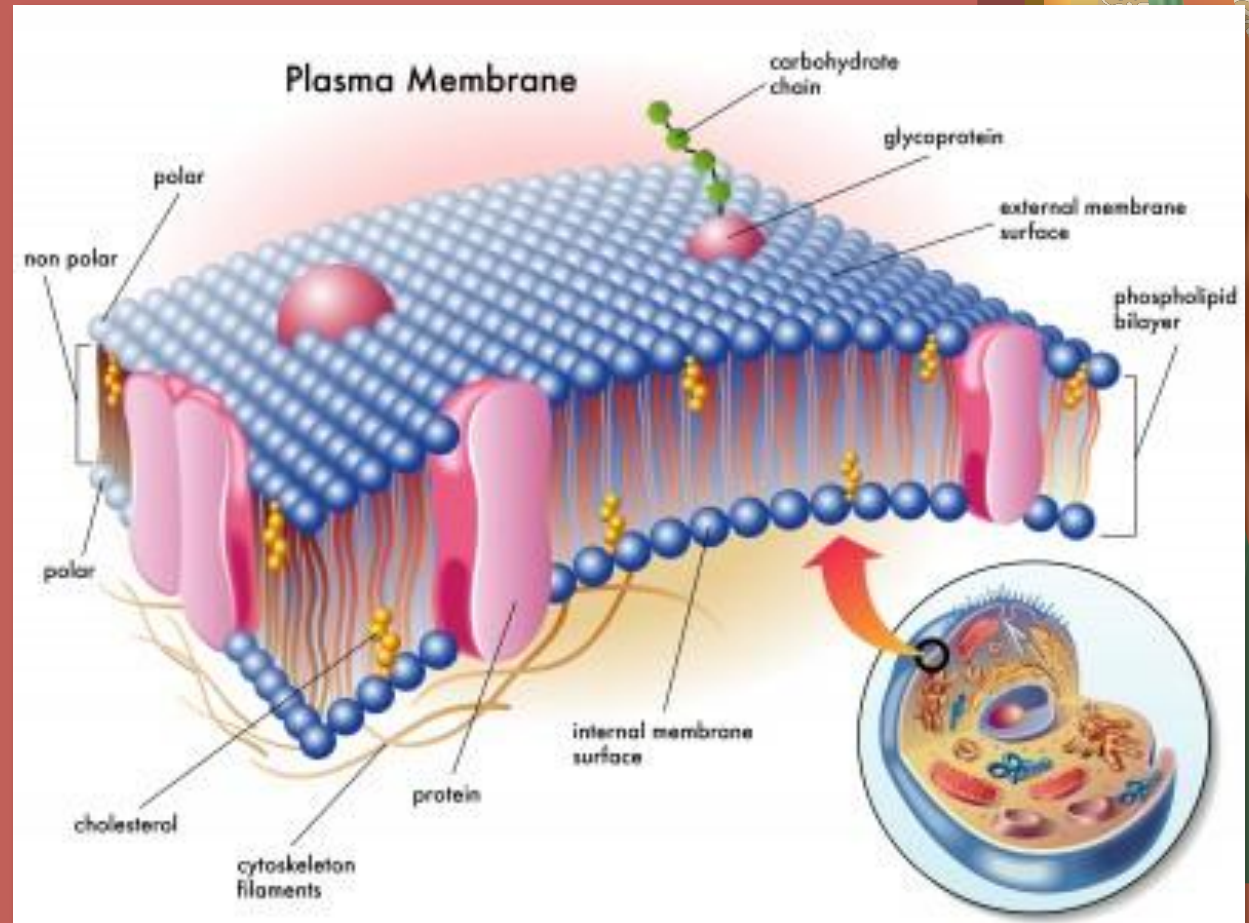
CELLULAR TRANSPORT



Plasma Membrane

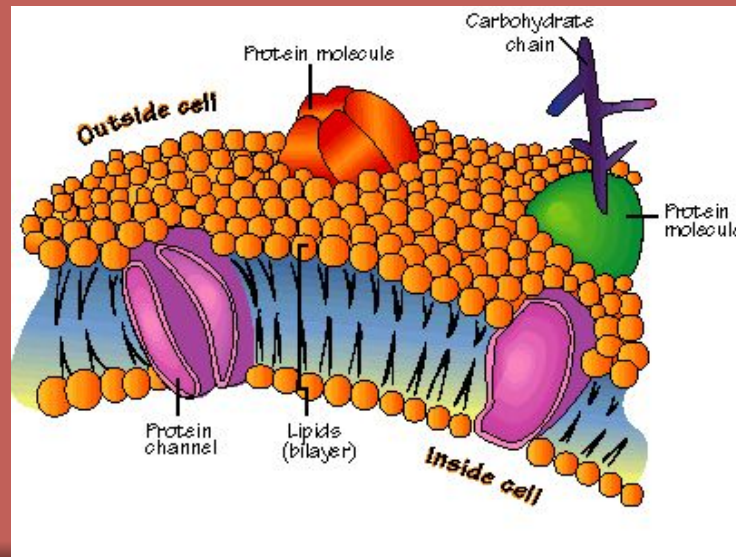
- All cells contain a cell membrane
 - Animals
 - Plants
 - Prokaryotes

Goal of cell transport is to move substances in and out of the cell



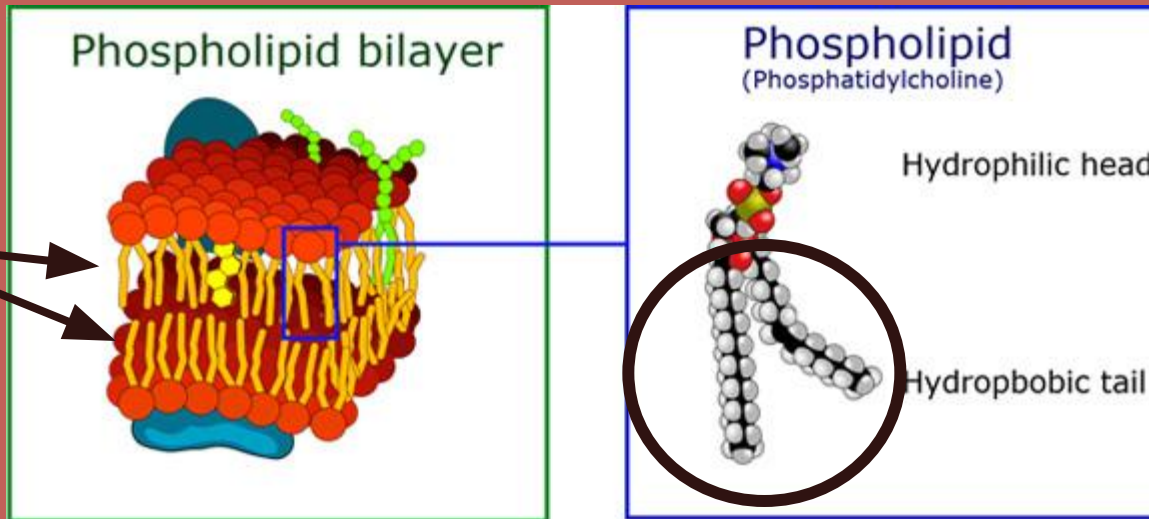
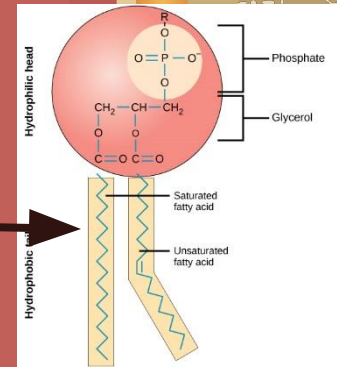
Cell membrane

- Made up of a double layered sheet called the lipid bilayer
- Gives the cell a flexible structure
- This forms a strong barrier between the cell and its surroundings



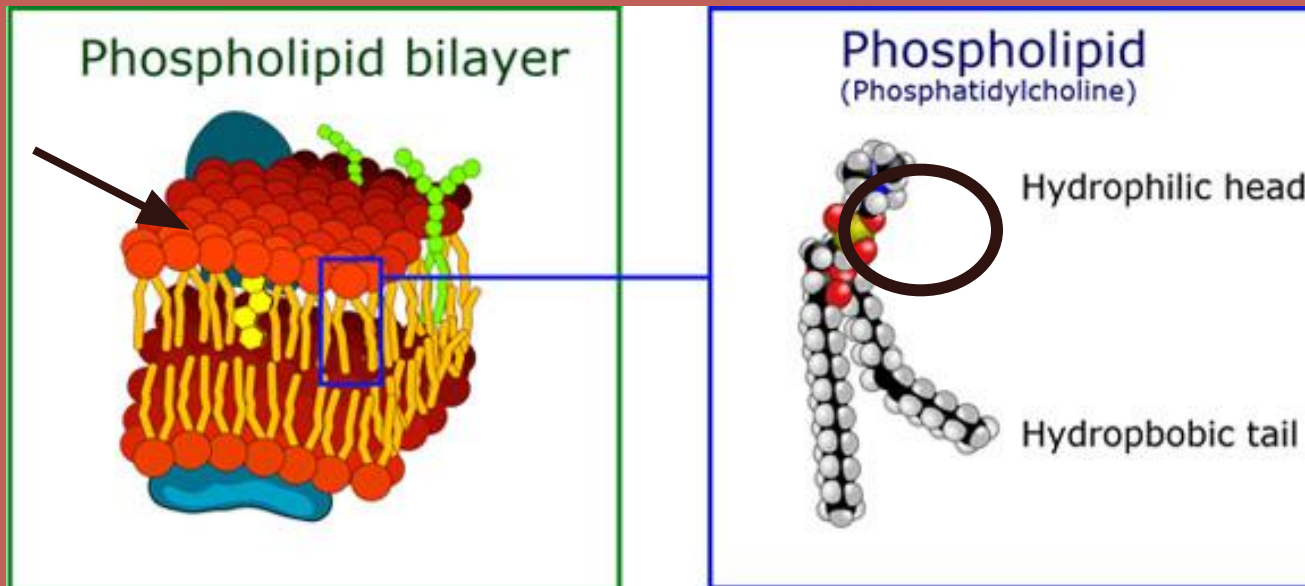
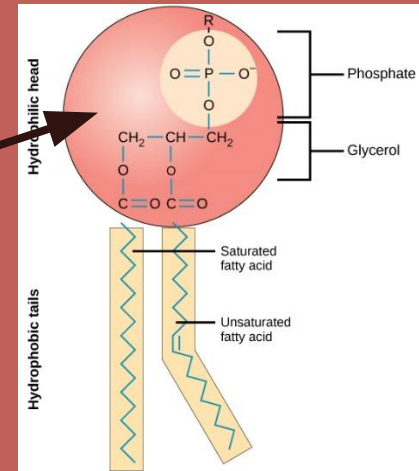
Lipid bilayer made of:

- **Fatty acid chains**
 - nonpolar and hydrophobic (repel water)
 - Called the tail end
 - Oily layer on inside of membrane



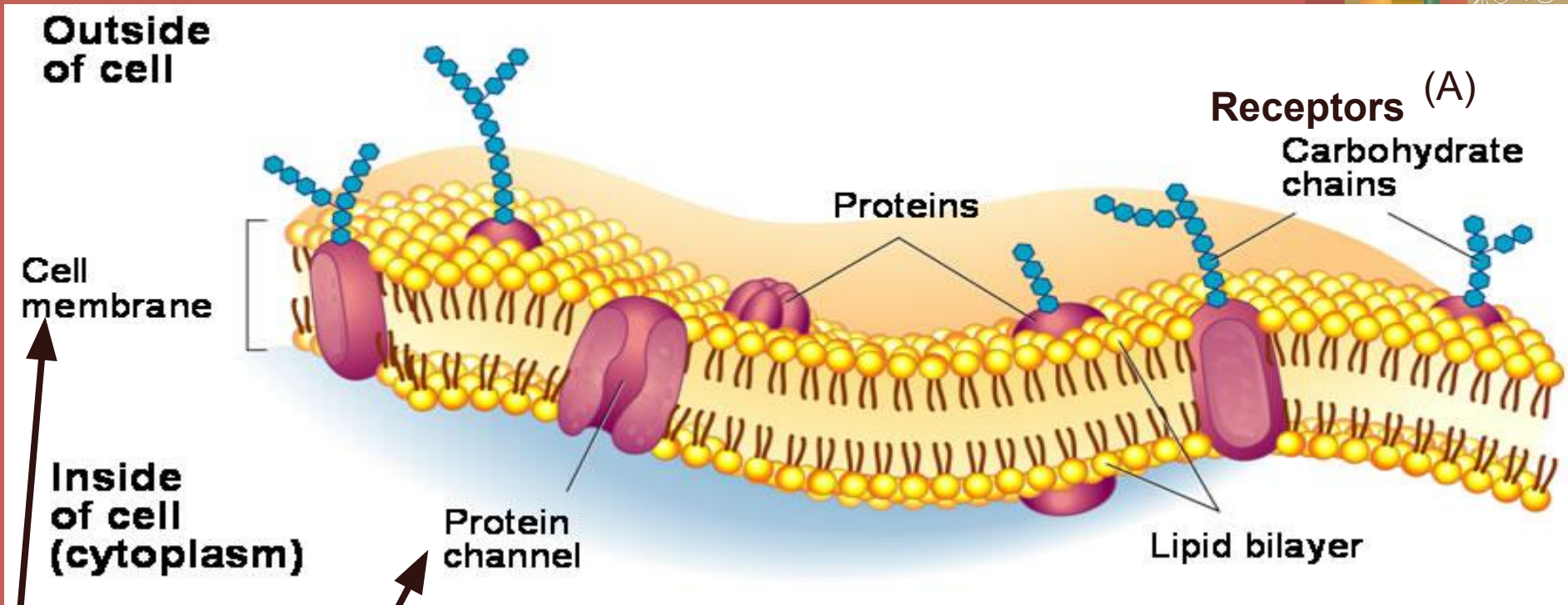
Lipid Bilayer made up of:

- **Glycerol**
 - Called the Head end
 - Polar and hydrophilic (water loving)
 - Form the outside of the membrane



Cell Membrane parts

(this should be like your drawing in in your notes)



AKA?

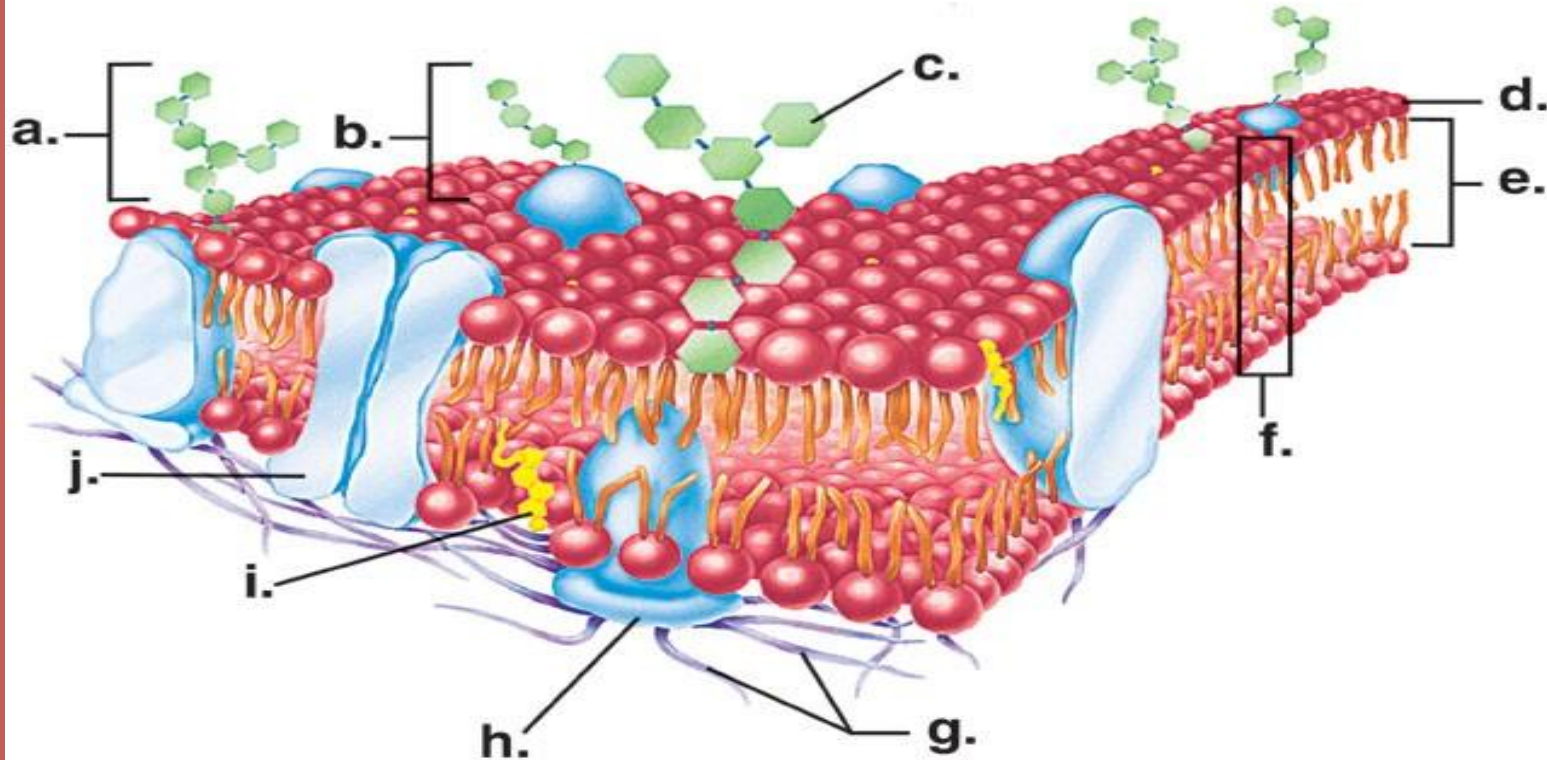
Question

- Why do scientists describe the cell membrane as a fluid mosaic?
- Why are some cell membranes called selectively permeable?



Cell Membrane Diagram (pg. 54)

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(A) Receptors
(B) Receptors
(C) Receptors

(D) Head ends
Hydrophilic end
(E) Tail ends
Hydrophobic end

(F) Plasma membrane
(G) Cytoskeleton
(I) Cholesterol

(H/J) Carrier Proteins
Transport proteins
Pumps

Quick video about Transport 😊

- <https://www.youtube.com/watch?v=Ptmlvtei8hw&t=6s>



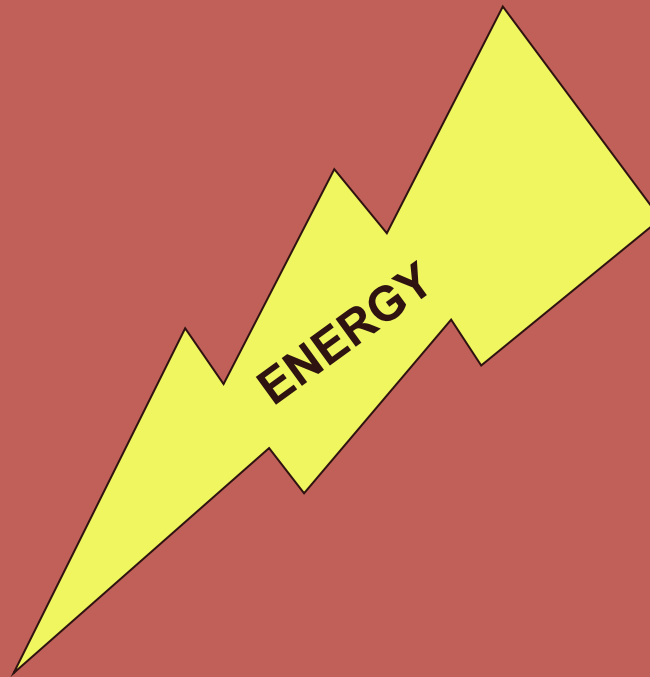
Transport Types

- **PASSIVE TRANSPORT**

- Diffusion
- Osmosis
- Facilitated Diffusion

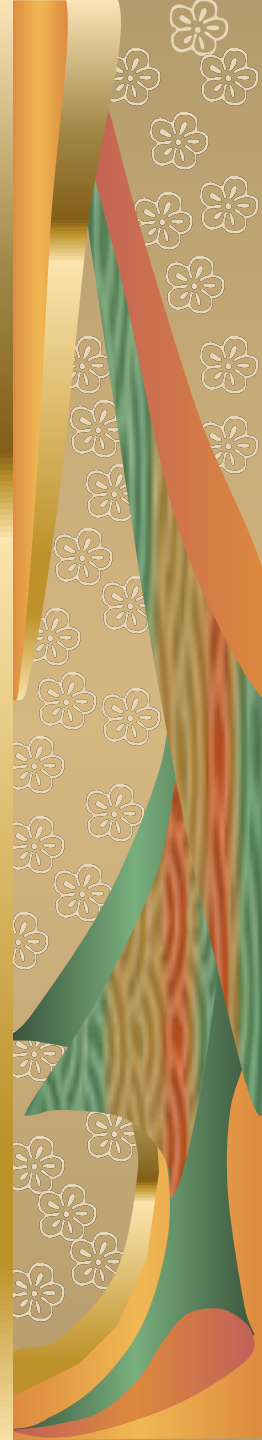
- **ACTIVE TRANSPORT**

- Protein Pump
- Endocytosis
- Exocytosis



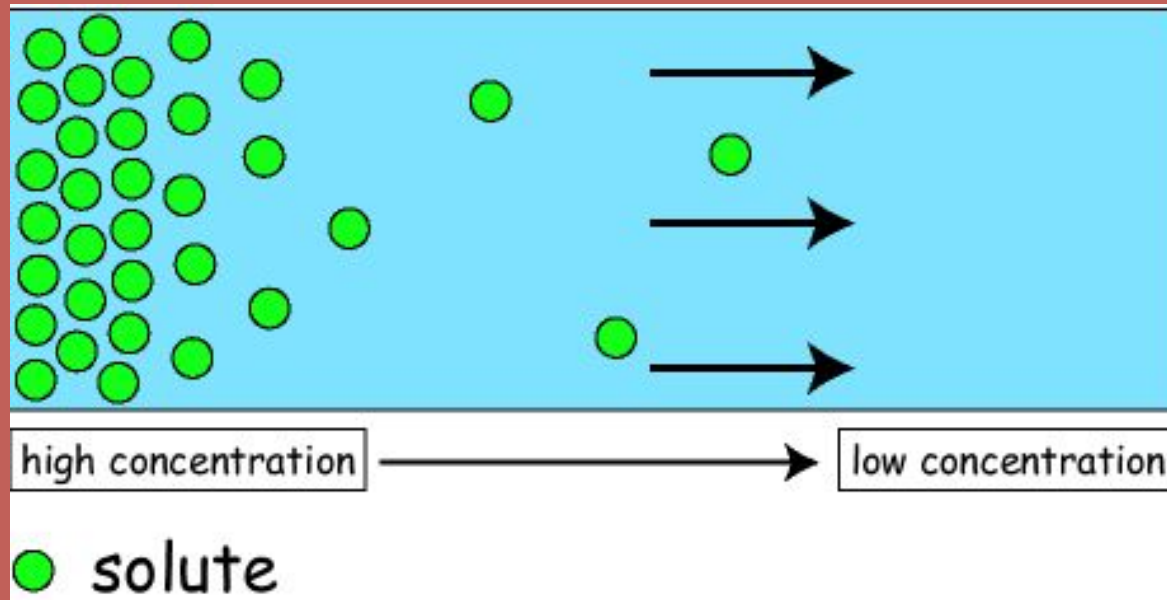
Passive Transport (add to notes)

- Movement of materials across the cell membrane without using energy
- This is movement with the gradient
- this is movement down the gradient



DIFFUSION

- Process by which particles move from an area of high concentration to an area of low concentration with NO energy
- Cellular cytoplasm consists of many different **solutes** dissolved in water
- **Solute** particles move constantly

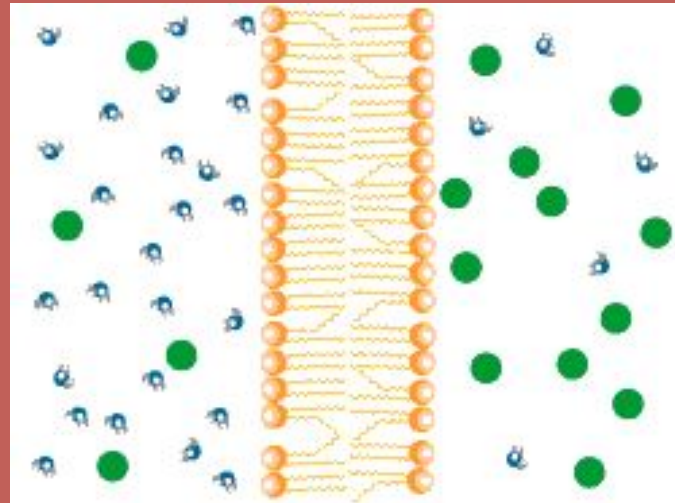


DIFFUSION continued

- Particles move from a high concentration to a low concentration until evenly distributed
- If a substance can cross the membrane its particles will move to the lower concentrated area until evenly distributed
- No energy used
- Examples:
 - Oxygen, CO₂

Factors that affect:

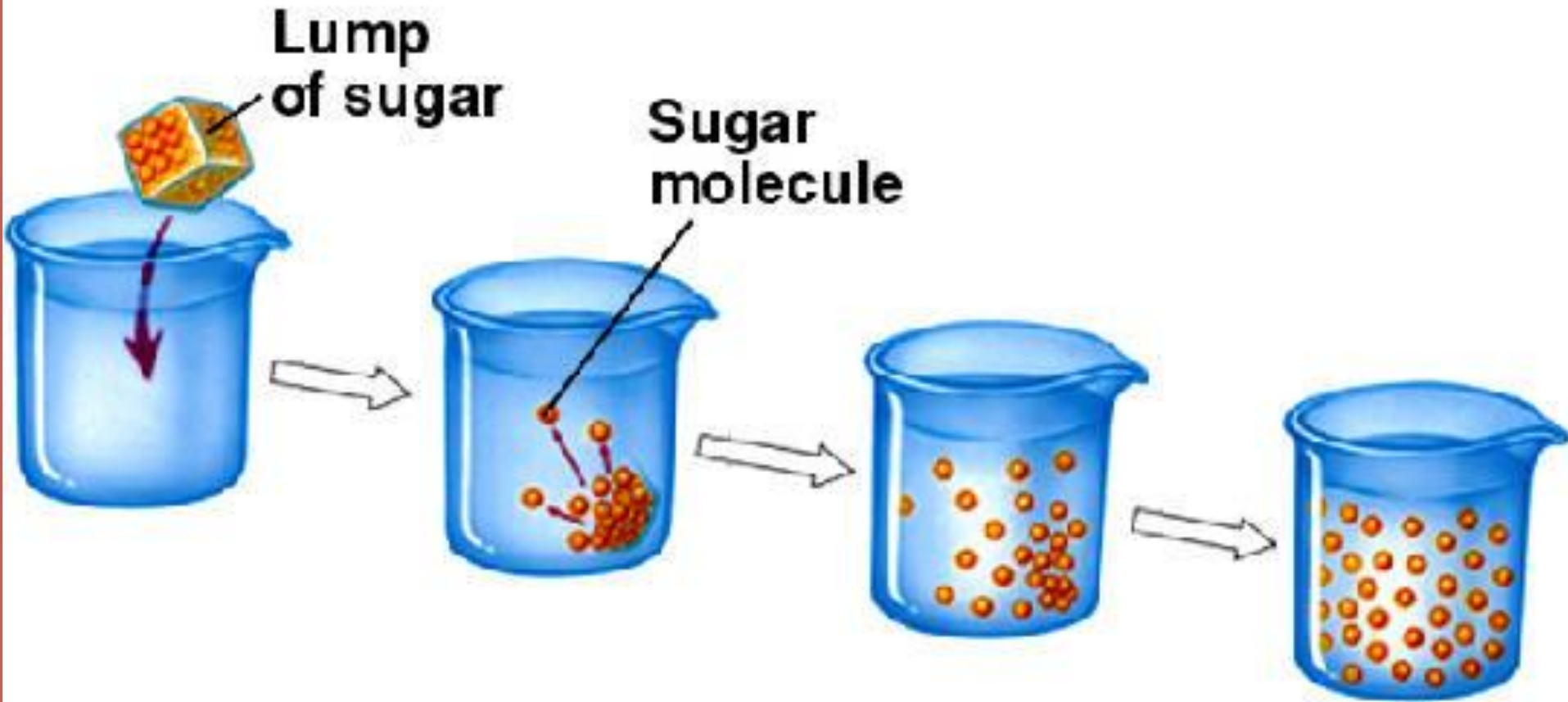
Temperature
Solute size
Concentration amount
Membrane surface



How will I remember
DIFFUSION?



Diffusion

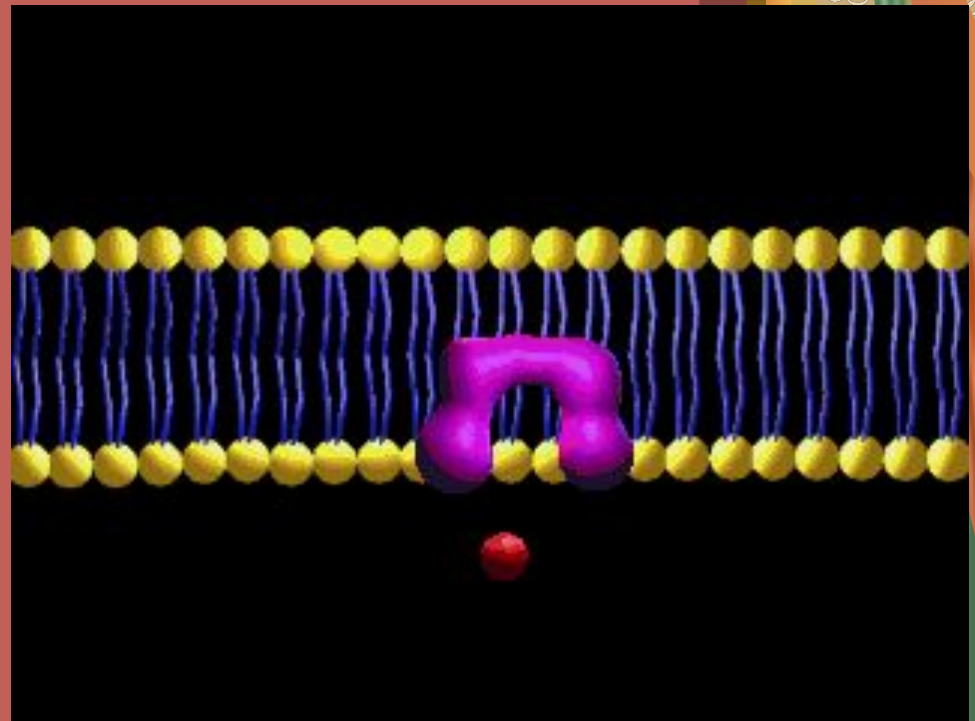


How will I remember (simple) DIFFUSION?

Facilitated Diffusion

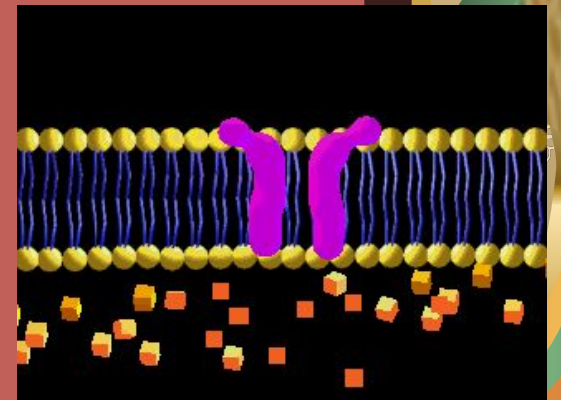
- *What happens to those molecules that need to cross but are too big or do not have a pass from the gatekeeper?*
- They use
 - **CARRIER PROTEINS**
 - **With NO energy**

DEFINITION: Process by which molecules use carrier proteins to help molecules across the membrane



Facilitated Diffusion

- Proteins stuck in the membrane act as **channels**
- This allows **molecules** to cross the membrane easily
- The protein channels that allow **glucose** across the membrane **facilitate or help** the diffusion of glucose across the membrane
- **No** energy
- Example: sugar (glucose)

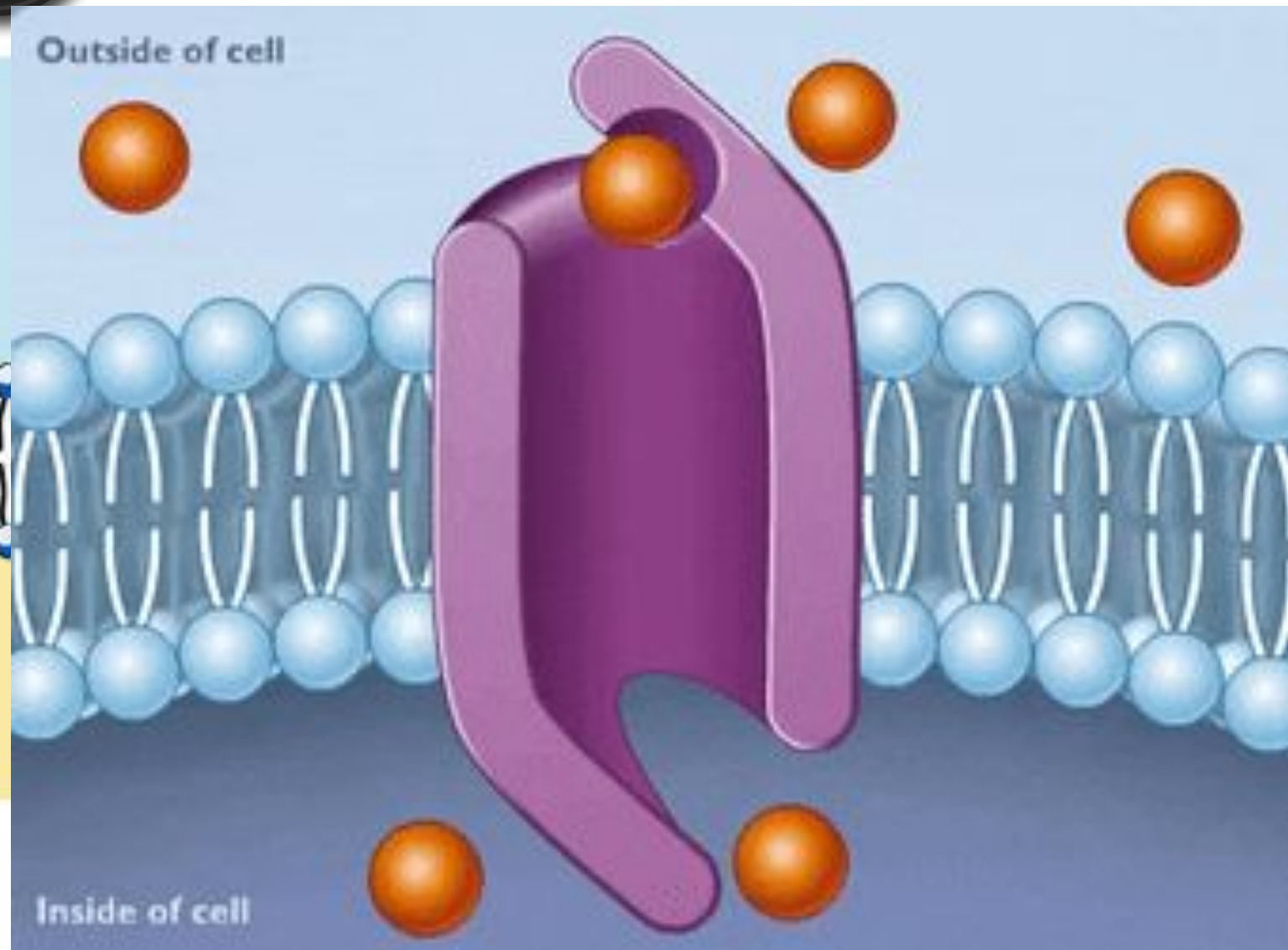


How will I remember
**FACILITATED
DIFFUSION?**



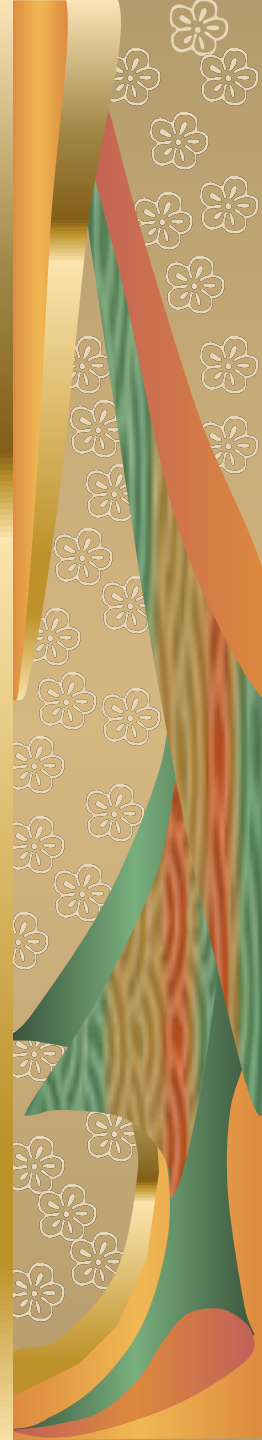


Facilitated Diffusion



Osmosis

- The diffusion of water through a selectively permeable membrane with NO energy
- Molecules move from an area of HIGH concentration to an area of LOW concentration
- The molecule that moves in osmosis= WATER
- Water continues to move across the cell membrane until equilibrium is reached
- Have a Sore throat
 - Told to gargle salt water... why?



Sore throat and salt water wash

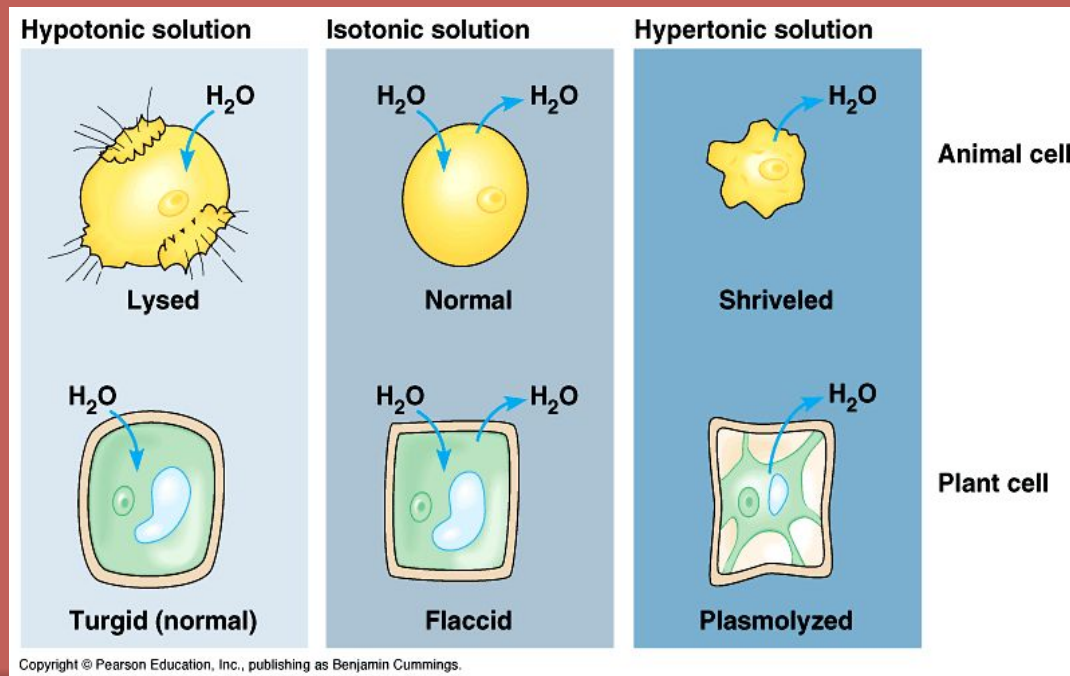


Cleaning a wound



3 types of Osmosis

- Isotonic Solution
- Hypertonic Solution
- Hypotonic Solution

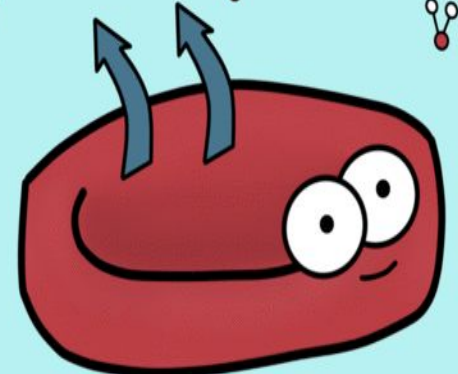
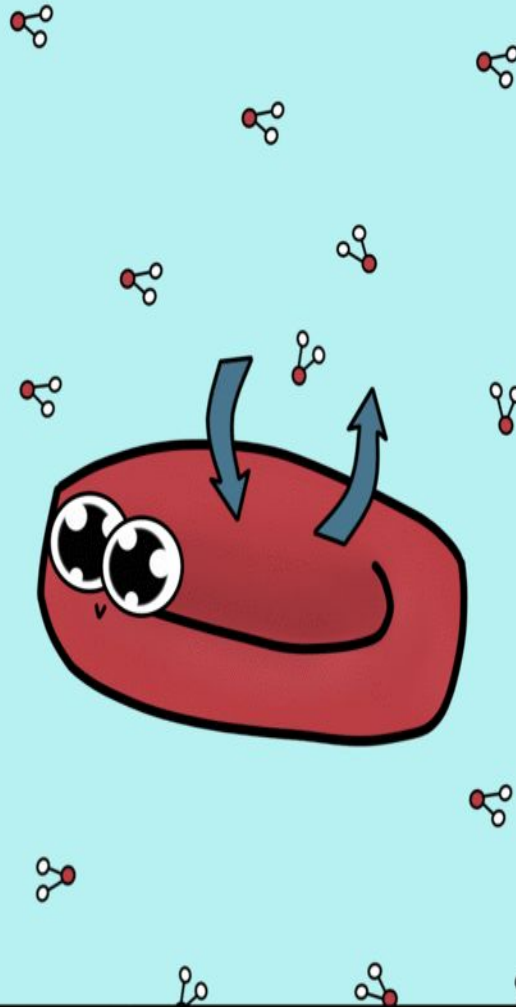


Passive Transport: Osmosis

Hypotonic Solution

Isotonic Solution

Hypertonic Solution



Water moves to hypertonic areas.

@AmoebaSisters

#1) ISOTONIC SOLUTION

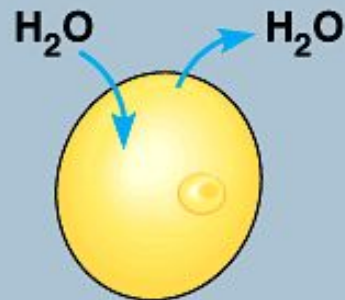
- If the water and solute molecules are the same on both sides of the membrane
- Isotonic means “same strength”
- Strength refers to the amount of solute NOT water
- Water moves in & out freely at the same rate
- Cell keeps its normal shape



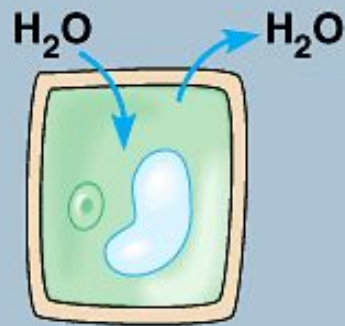
ISOTONIC SOLUTION

Perfect
conditions

Isotonic solution



Normal



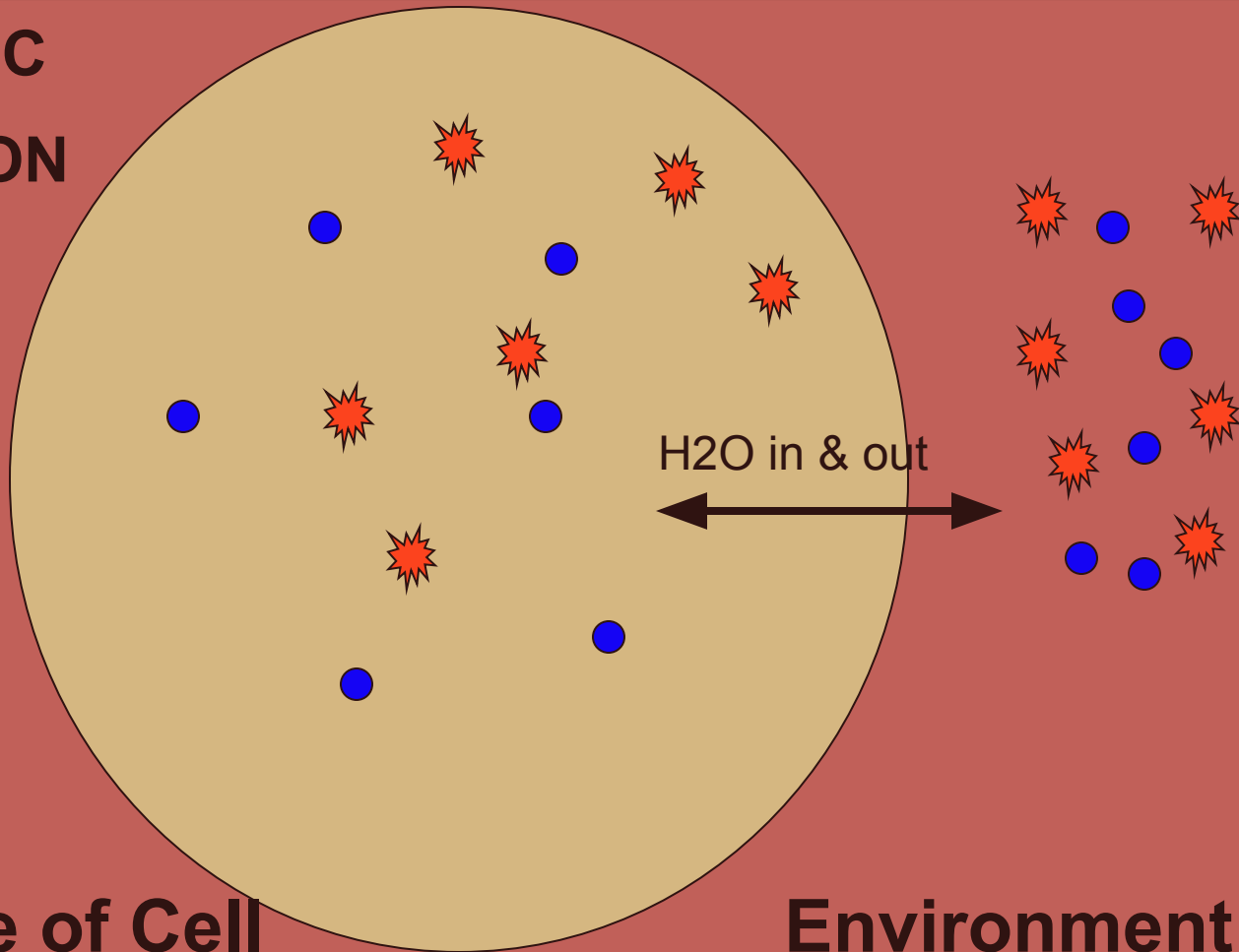
Flaccid

Animal cell

Plant cell

as Benjamin Cummings.

ISOTONIC SOLUTION



BEST
place for
an animal
cell

Inside of Cell

- Solute **equal**
- Water **equal**
- Means: **Isotonic solution**

RESULT OF
CELL:
stays the
same

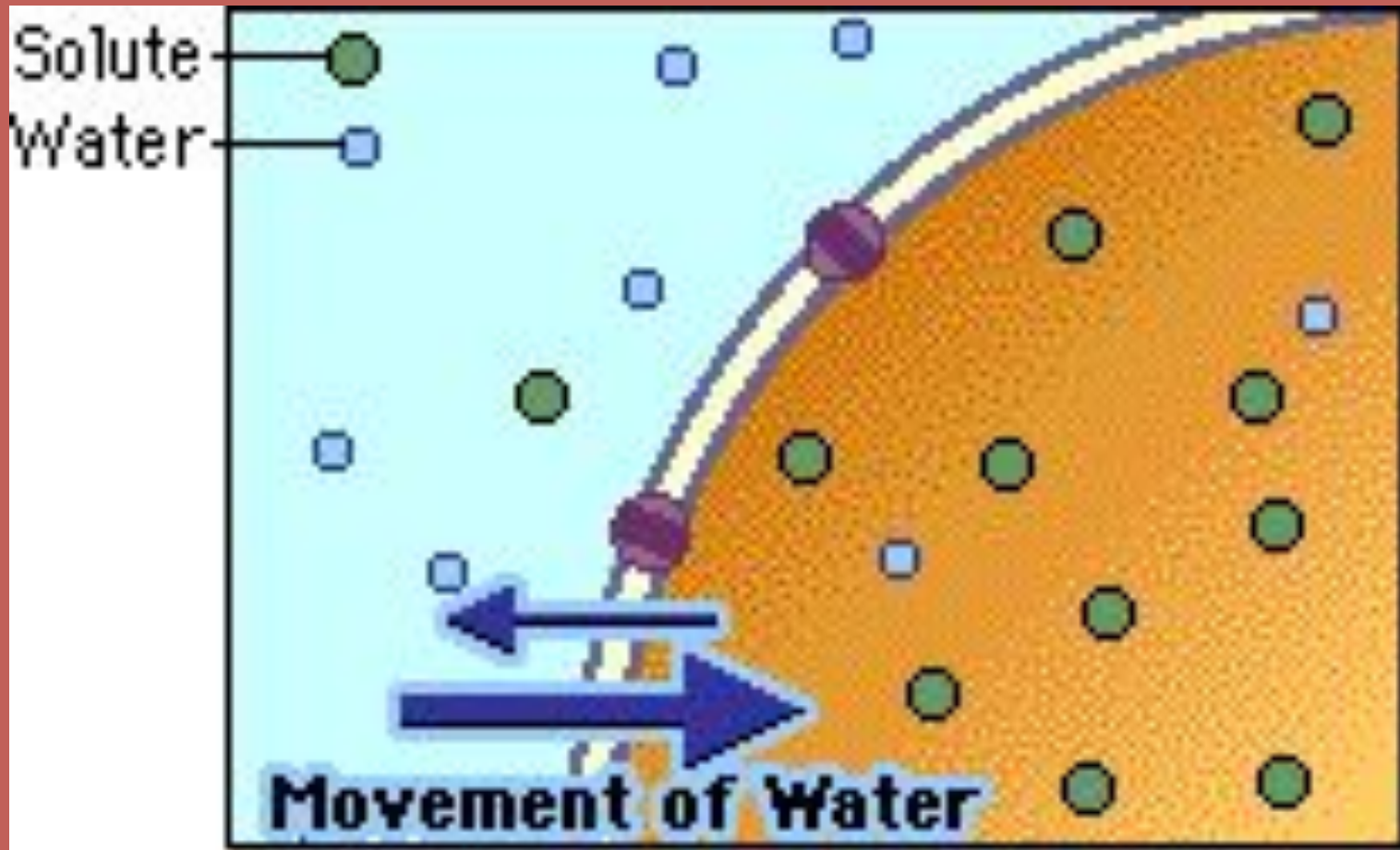
Environment

Solute **equal**
Water **equal**
Means: **Isotonic solution**

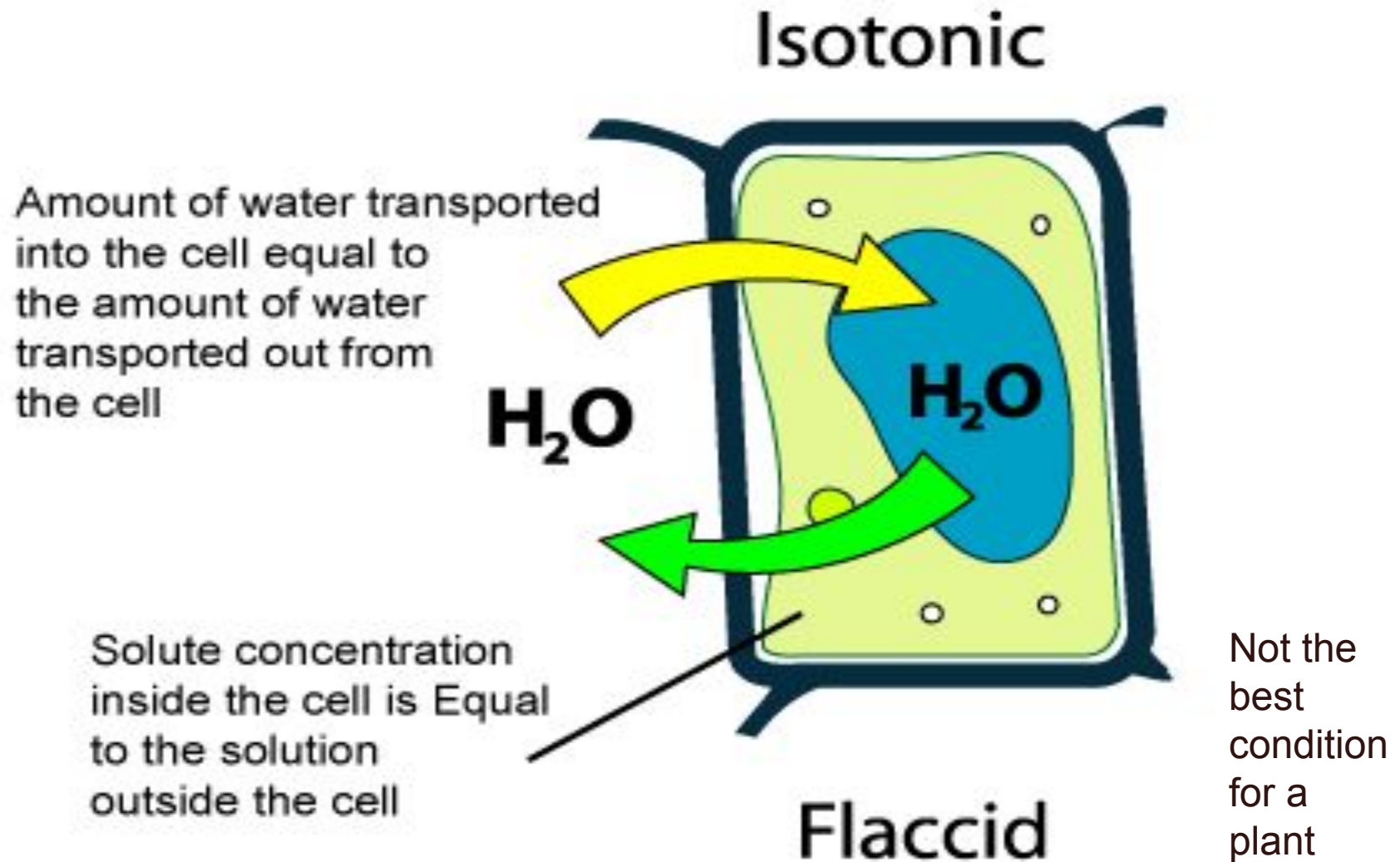


ISOTONIC SOLUTION

Water move freely IN and out



Isotonic Cell Solution



#2) HYPERTONIC Solution

- Hypertonic means above strength
- The solution has a higher solute concentration than the inside of the cell
 - Low water amount high solute amount OUTSIDE
 - High water amount low solute amount INSIDE
- Result: Water moves out of cell
- Cell shrinks

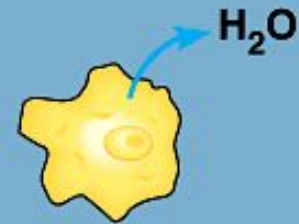


HYPERTONIC SOLUTION

Not good for animals
since it is shrinking
(**Dehydrated**)

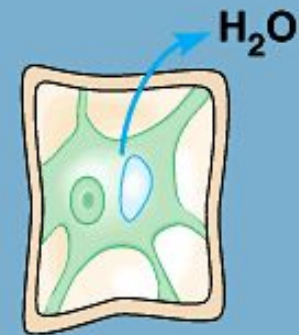
Not good for plants
since it is **wilting**

Hypertonic solution



Animal cell

Shriveled

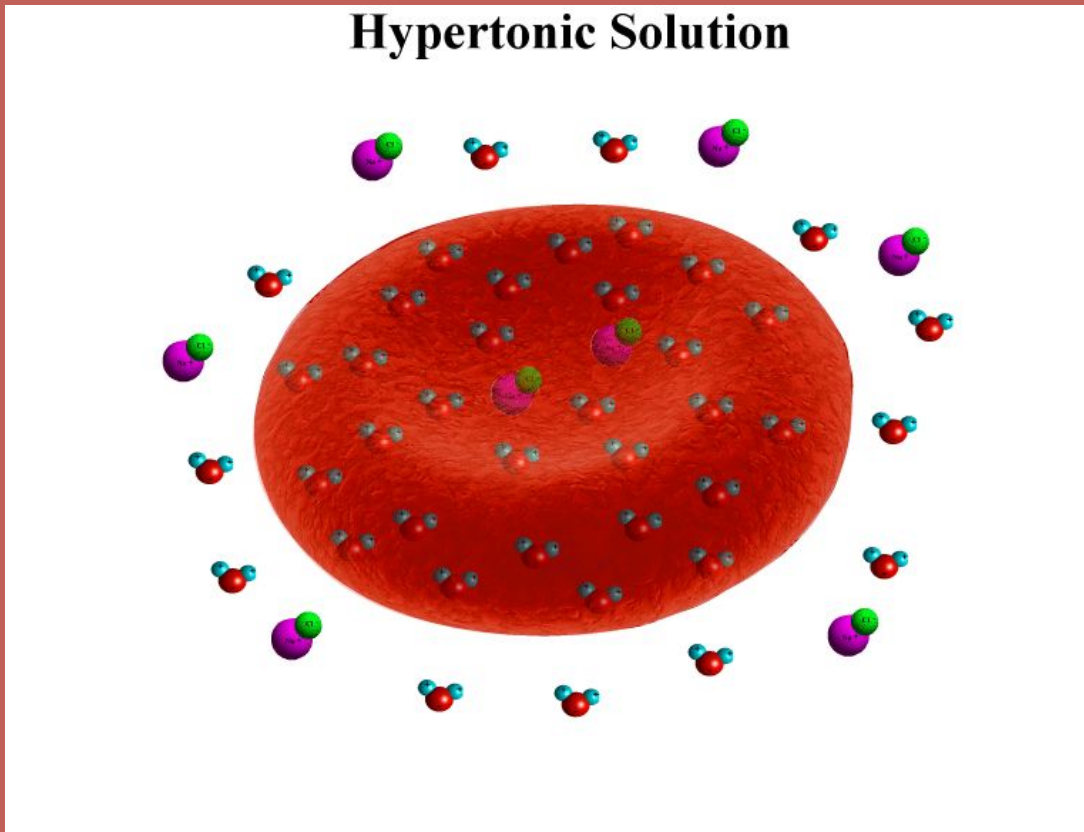


Plant cell

Plasmolyzed

Hypertonic Solution

Water will move OUT the cell
Cell will shrink



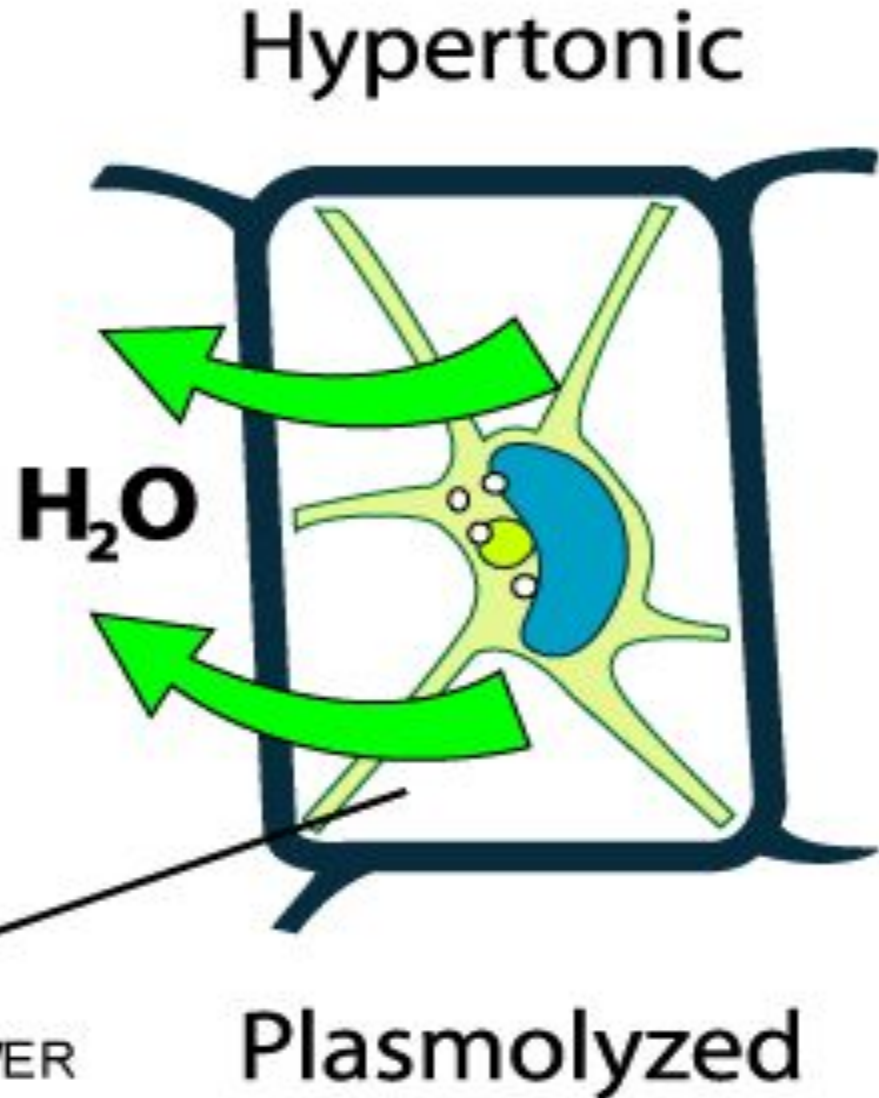
Hypertonic Cell Solution

This is a plant cell in a hypertonic solution

Water is transported out from the cell



Solute concentration inside the cell is LOWER



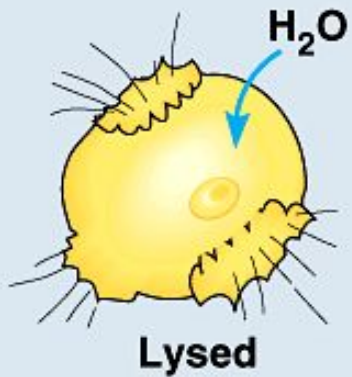
#3) HYPOTONIC SOLUTION

- Hypotonic means below strength
- The solution has a lower solute concentration than the inside of the cell
 - High water amount low solute amount OUTSIDE
 - Low water amount high solute amount INSIDE
- Results: Water moves into the cell
- Cell will swell



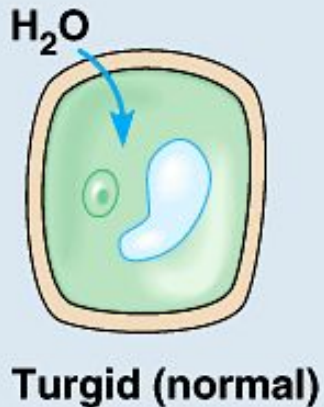
HYPOTONIC SOLUTION

Hypotonic solution



Not good since the cell is too big (**bloated**) and could burst

Animal cell

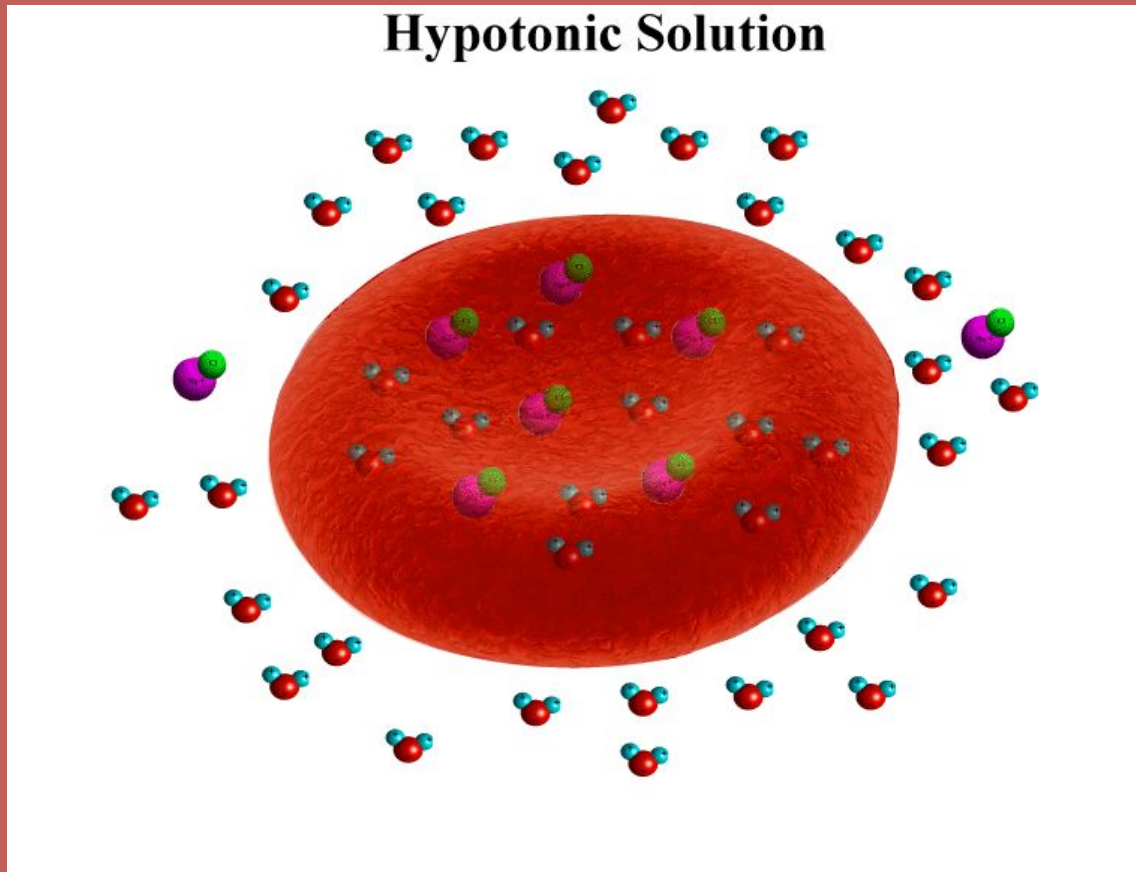


Best for a plant since the vacuole is full and pushes against the cell membrane/wall causing the plant to be upright

Plant cell

Hypotonic Solution

Water will move INTO the cell
The cell will swell



Hypotonic Cell Solution



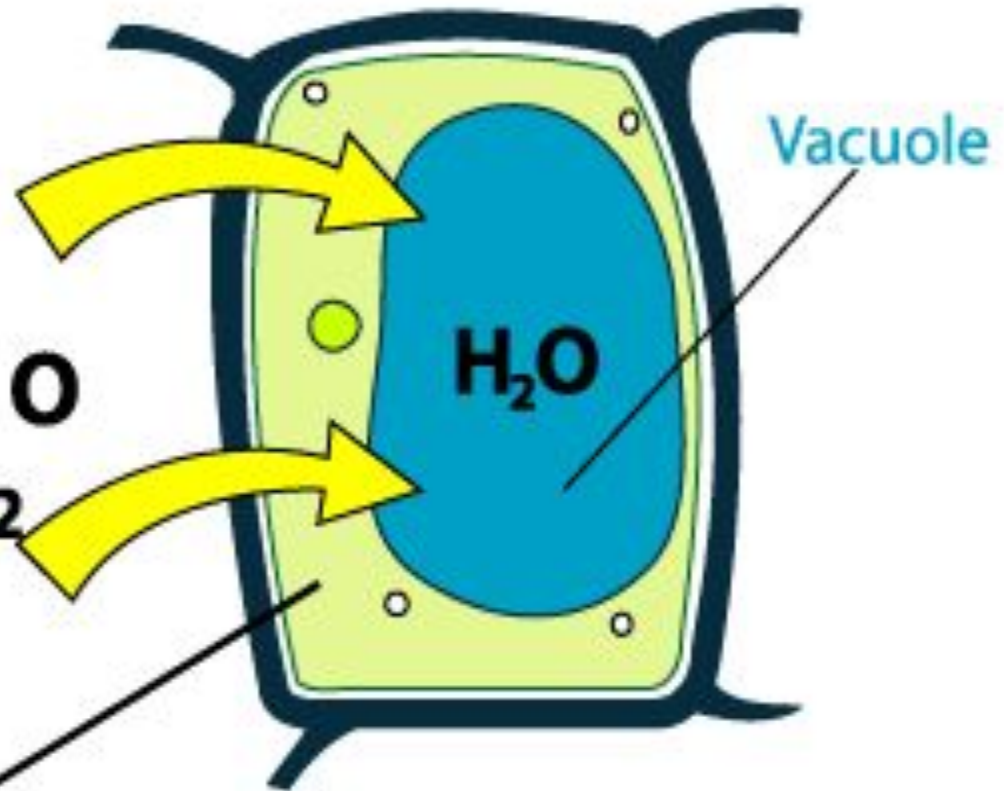
Water is transported
into the cell

H_2O

2

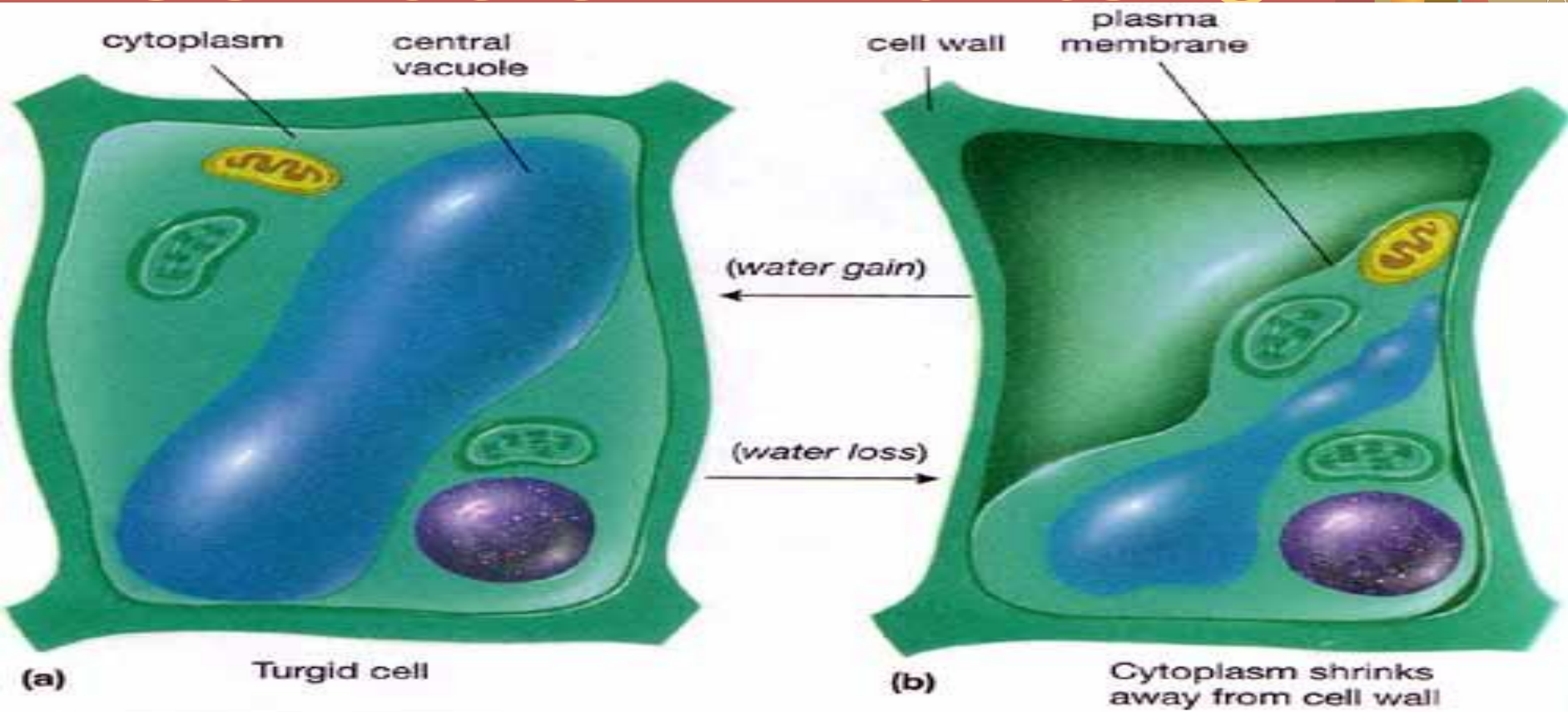
Solute concentration
inside the cell is HIGHER

Hypotonic



Turgid

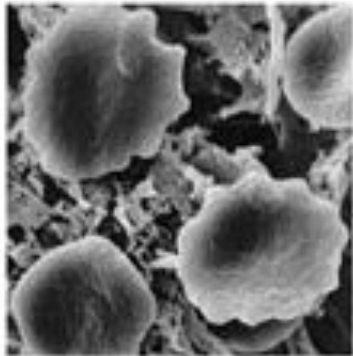
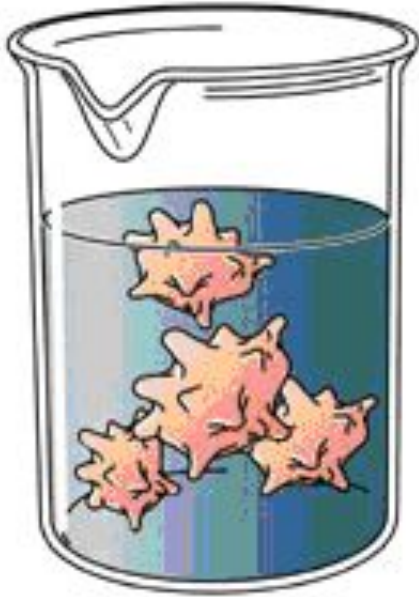
Osmosis in Plants ☺



Hypotonic

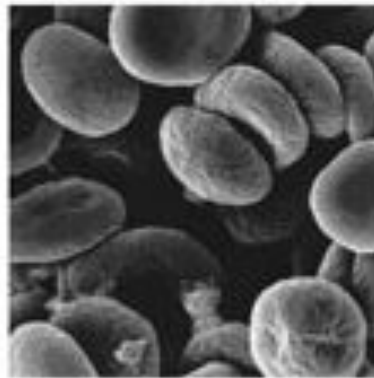
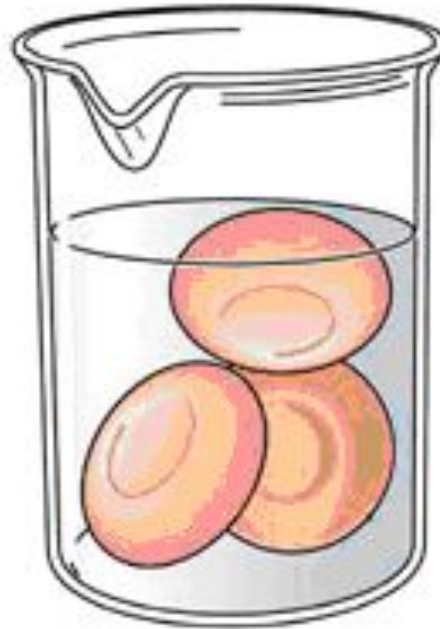


Hypertonic



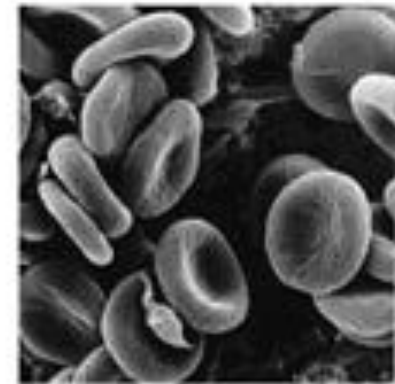
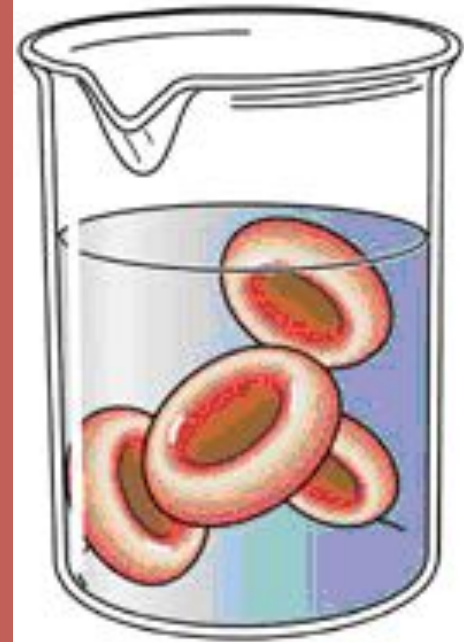
B.

Hypertonic solution
(higher concentration
of ions in solution
than in cell)



C.

Hypotonic solution
(lower concentration
of ions in solution
than in cell)

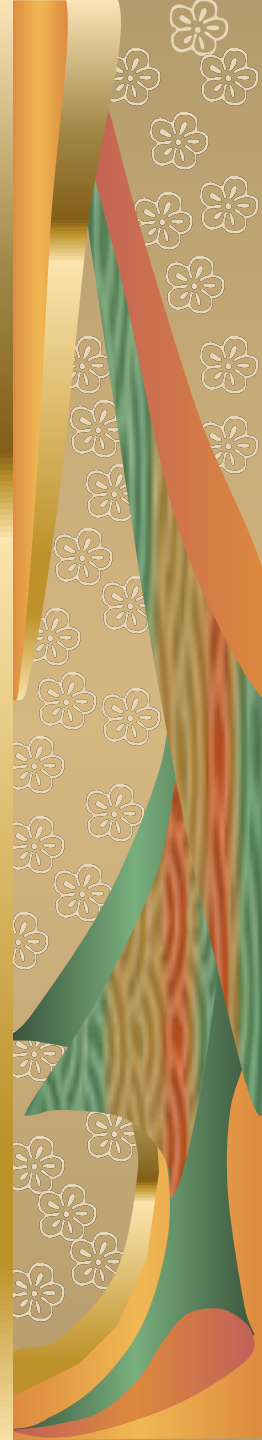


A.

Isotonic solution
(equal concentration
of ions in solution
and cell)

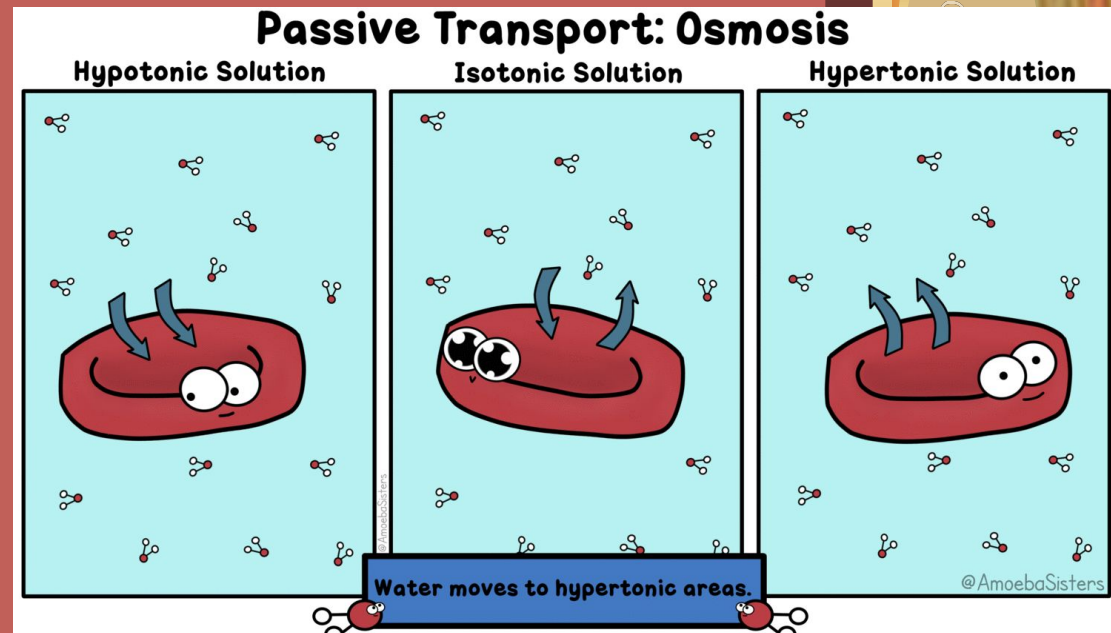
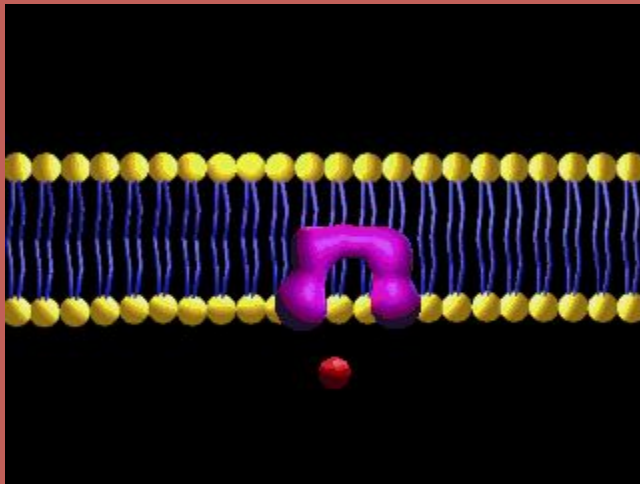
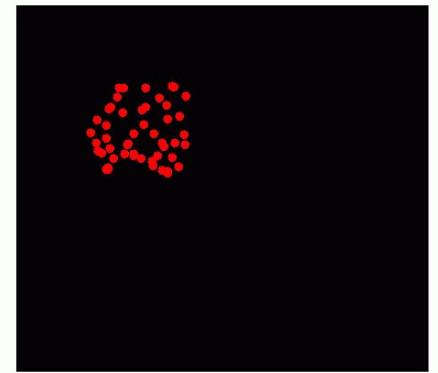
How will I remember...

- Isotonic Solutions?
- Hypertonic Solutions?
- Hypotonic Solutions?



Passive Transport Recap

- Diffusion
- Osmosis
- Facilitated Diffusion



Osmosis Practice

DINNER?

- 1
- 2
- 1
- 2
- 3
- 4
- 5
- 6

Picture

- 1
- 2
- 3
- 1
- 2
- 3
- 4
- 5

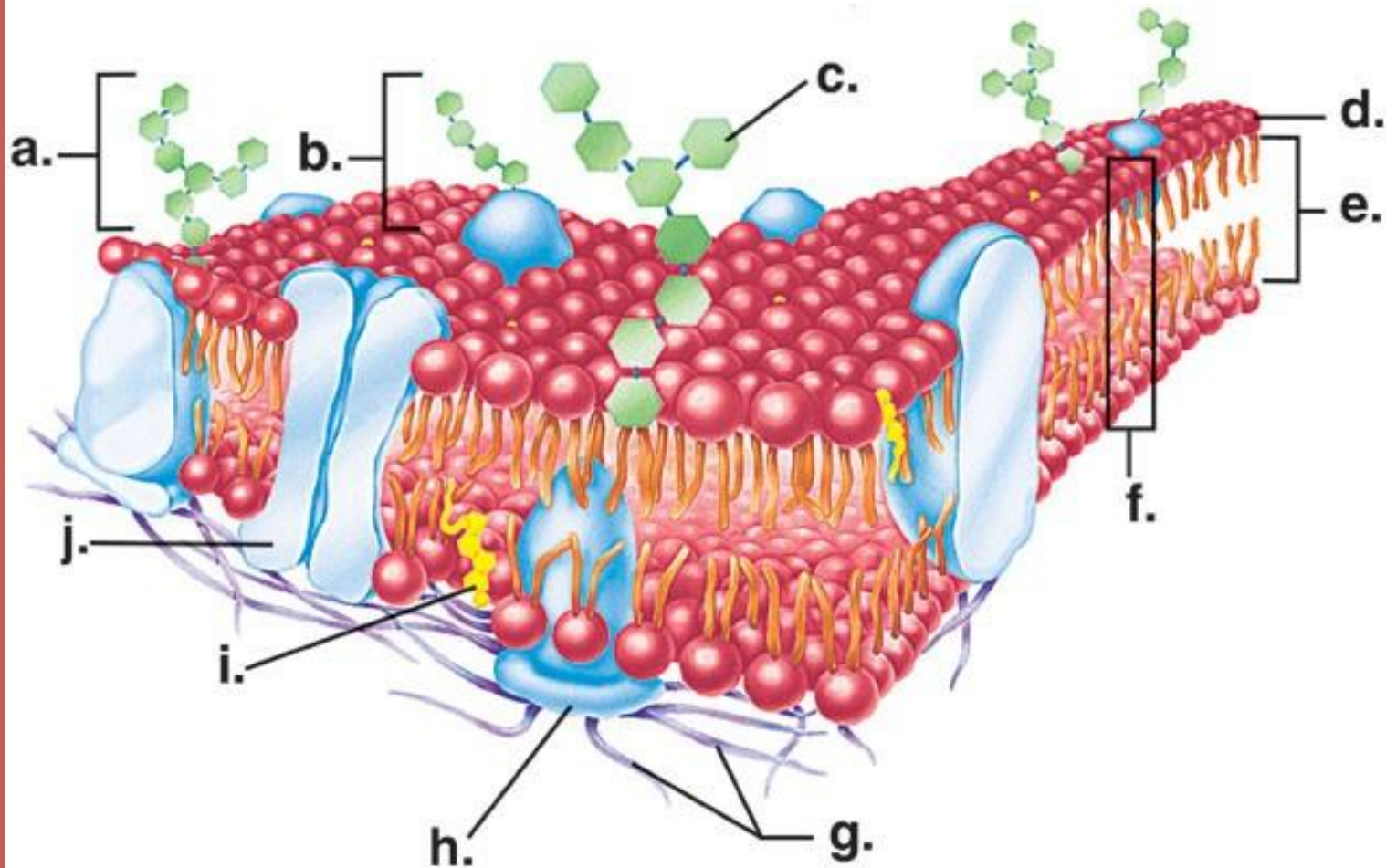


Vocabulary

- Complete the vocabulary on page 56 of your journal book
- TEST yourself
 - Try without notes



Do you Remember?



Journal Page 55-Practical Application

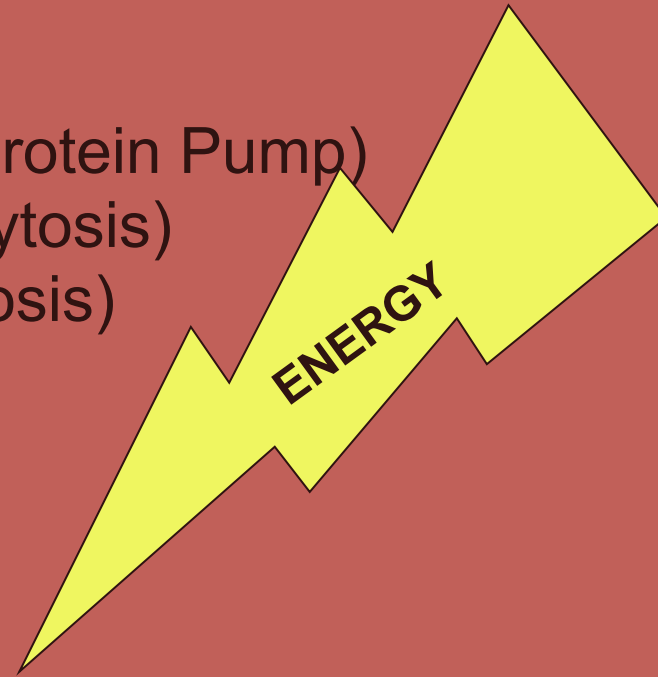
Problem	Explanation	Solution
1	Water moves out; causing it to shrink	hypertonic
2	Water moves ; cell will	tonic
3	Water moves ; cell will	tonic
4	Water moves ; cell will	tonic
5	Water moves ; cell will	tonic
6	Water moves ; cell will	tonic
7	Water moves ; cell will	tonic
8	Water moves ; cell will	tonic
9	Water moves ; cell will	tonic
10	Water moves ; cell will	tonic

ACTIVE TRANSPORT



Transport Types

- **PASSIVE TRANSPORT**
 - 1) *Diffusion*
 - 2) *Facilitated Diffusion*
 - 3) *Osmosis*
- **ACTIVE TRANSPORT**
 - 1) Molecular Transport (Protein Pump)
 - 2) Bulk Transport (Endocytosis)
 - 3) Bulk transport (Exocytosis)



Active Transport

- DEF: The movement of materials **AGAINST** the concentration gradient
- Requires **Energy**
- **Carrier proteins** must be used





ing a bicycle

when you go down

- Which way are the molecules moving?

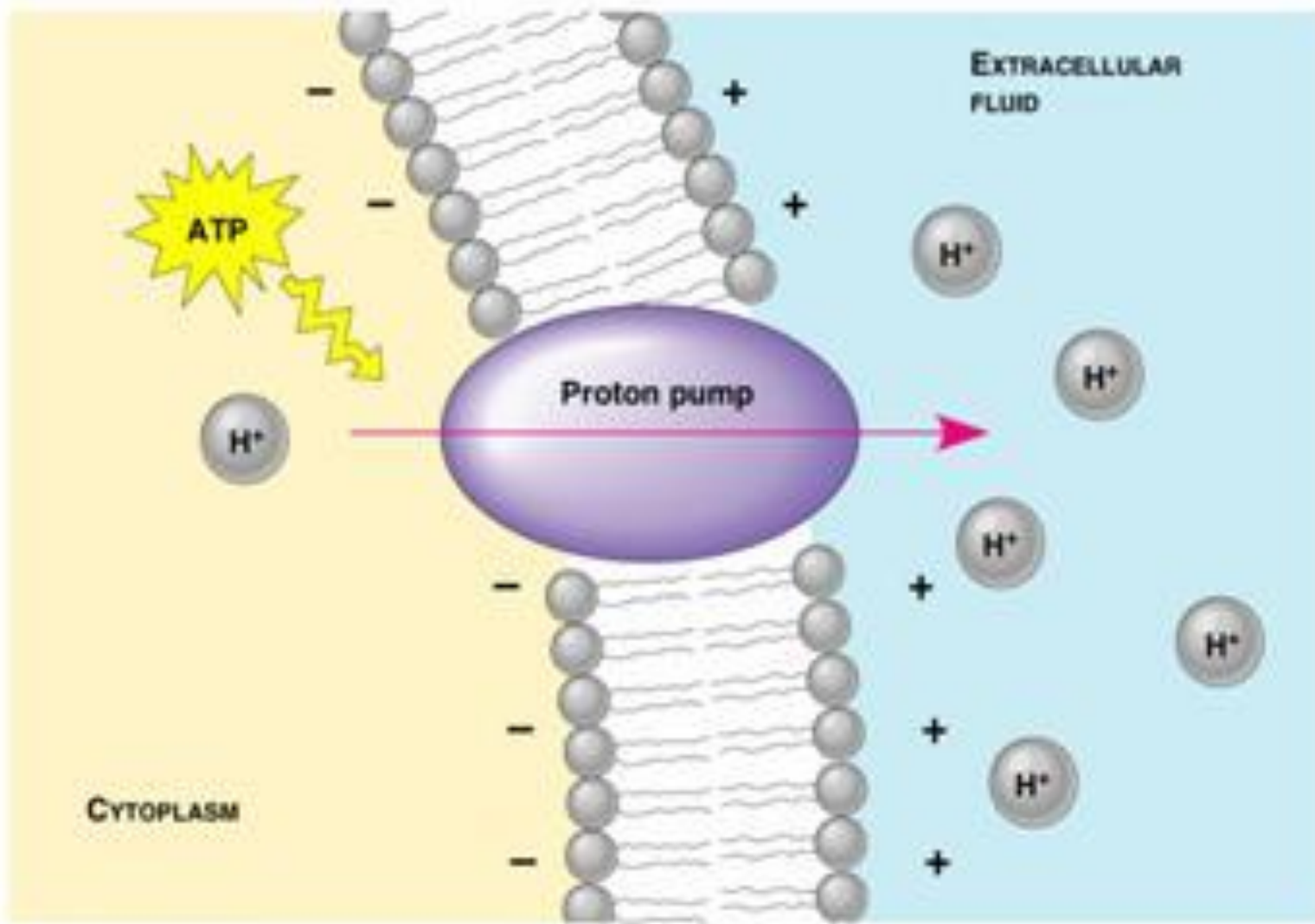
What happens when you go up



molecules moving



Active Transport



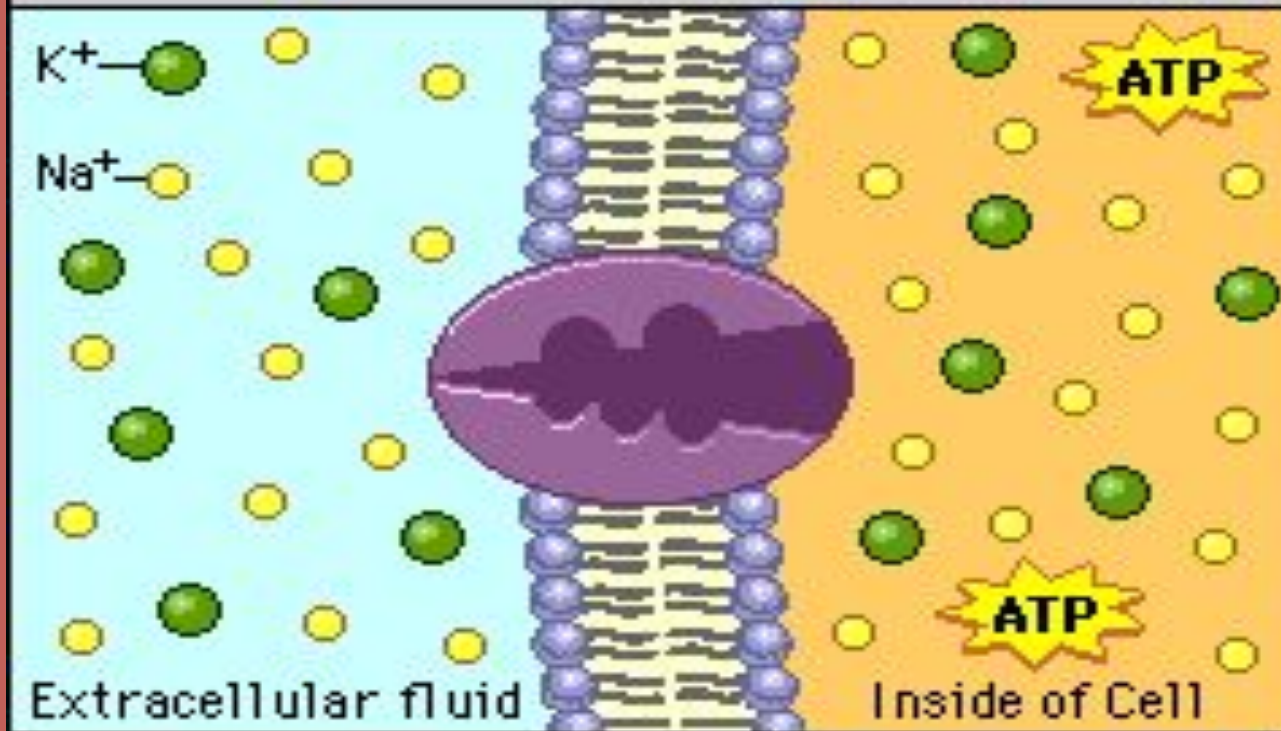
Molecular Transport (Protein Pumps)

- Small molecules and ions are carried across membranes by proteins in the membrane that act like pumps
- Examples: Calcium (Ca^+), Potassium (K^+), Chlorine (Cl^-), Sodium (Na^+)



Sodium- Potassium Pump

Step 1. Three Na^+ ions bind to cytoplasmic high-affinity binding sites.



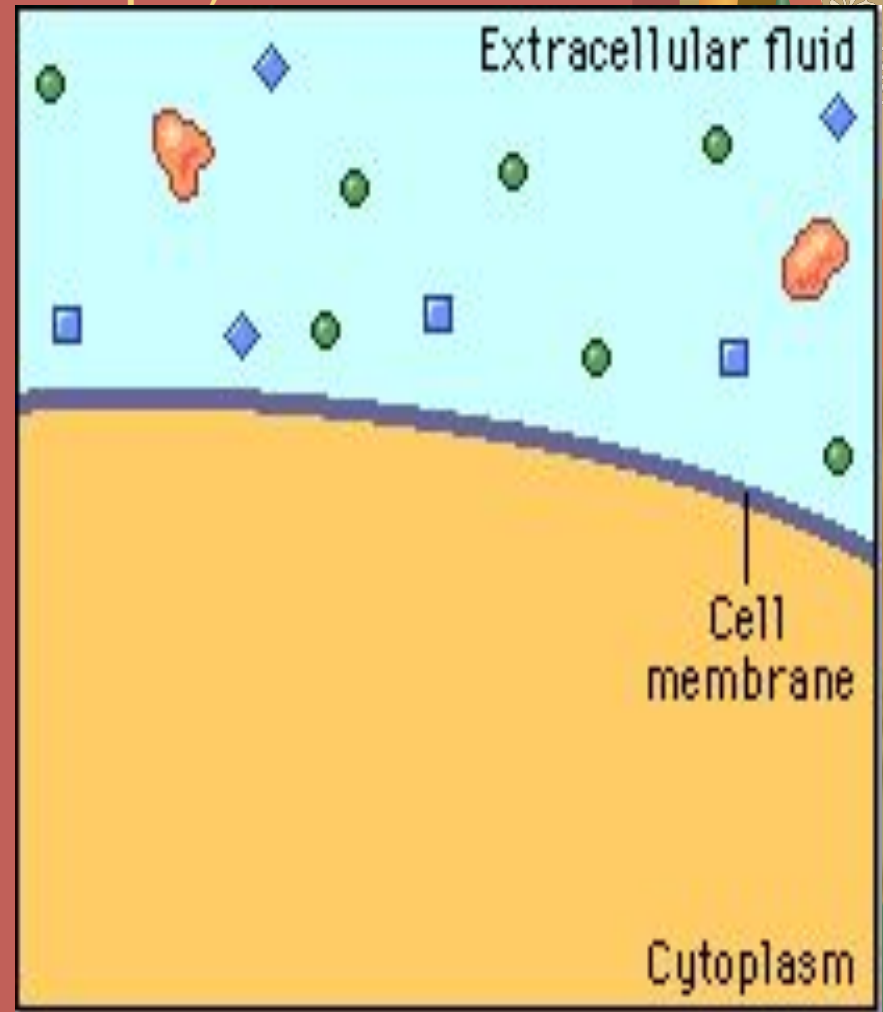
Bulk Transport

- Large molecules and even solid clumps of material can be transported by movement of the membrane
- This depends on the size and shape of material
- 2 types
 - Endocytosis
 - Exocytosis



Endocytosis (type of bulk transport)

- Cell process of taking material into the cell by infoldings or pockets of cell membrane
- The pocket will break loose from the **outer** portion of the membrane and form **vesicles**
 - Examples: food, nutrients
 - Bringing large molecules **INTO** the cells using **vesicles** and **energy**



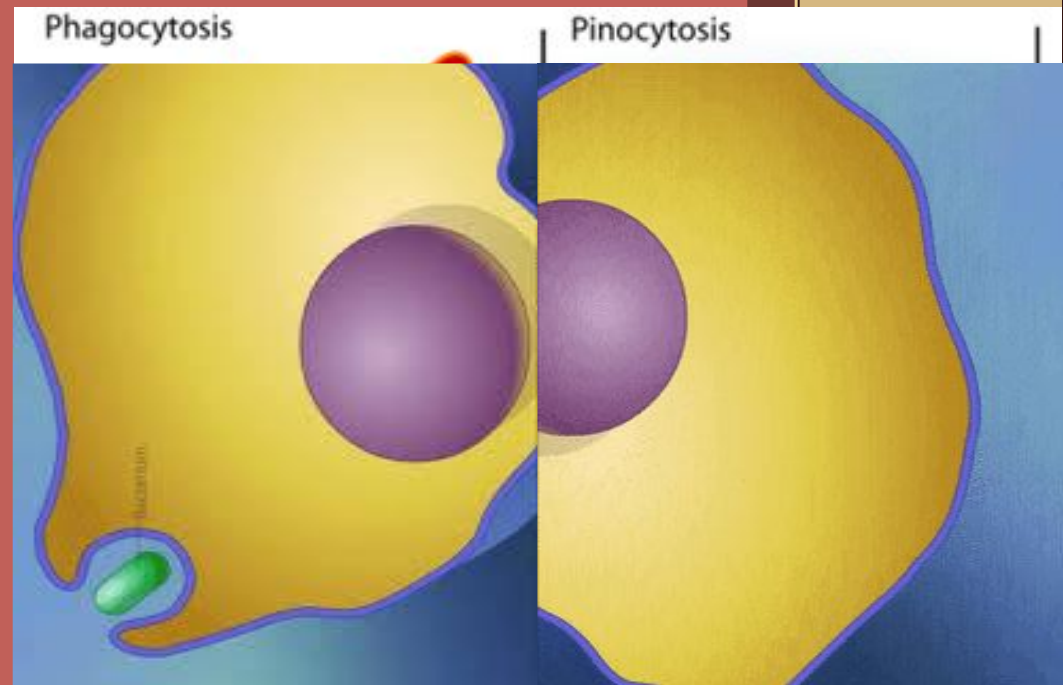
Endocytosis 2 main types

• PHAGOCYTOSIS

- Type of endocytosis where the membrane surrounds a particle brings it IN
- Amoeba use to bring in food
- White blood cells “eat” damaged cells

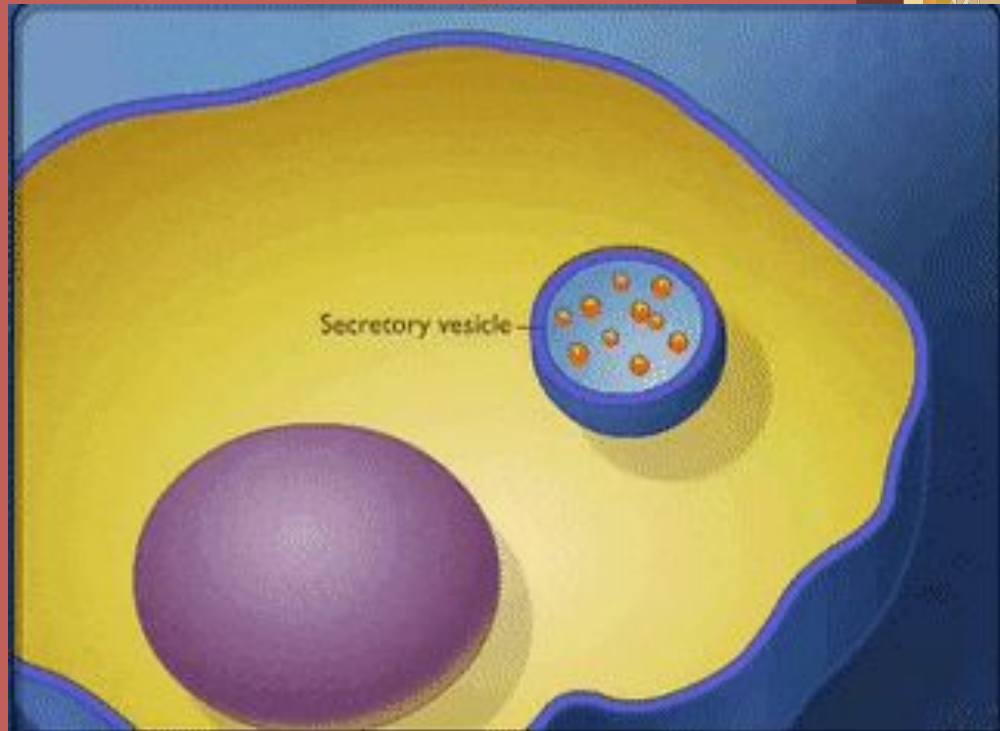
PINOCYTOSIS

- Type of endocytosis
- Brings in liquid into the cell

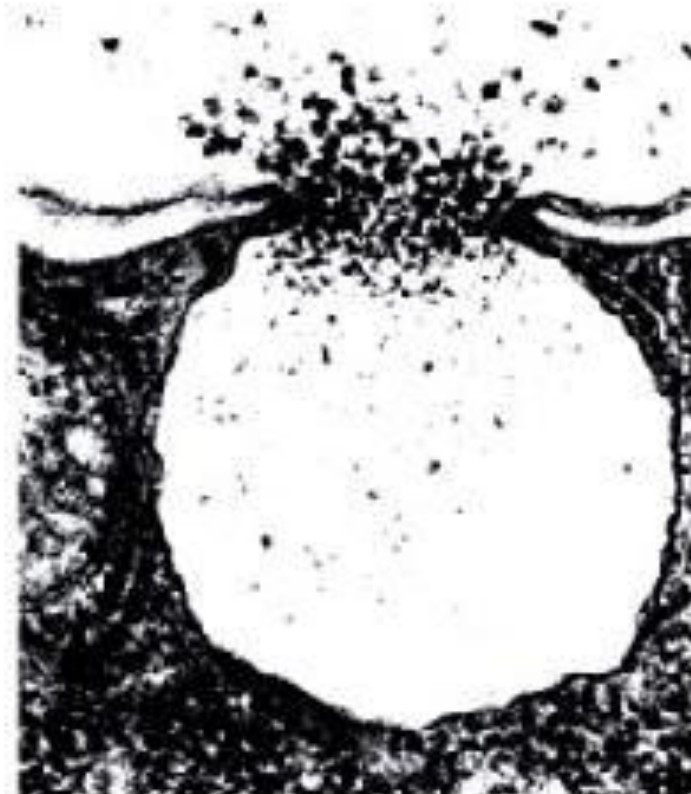
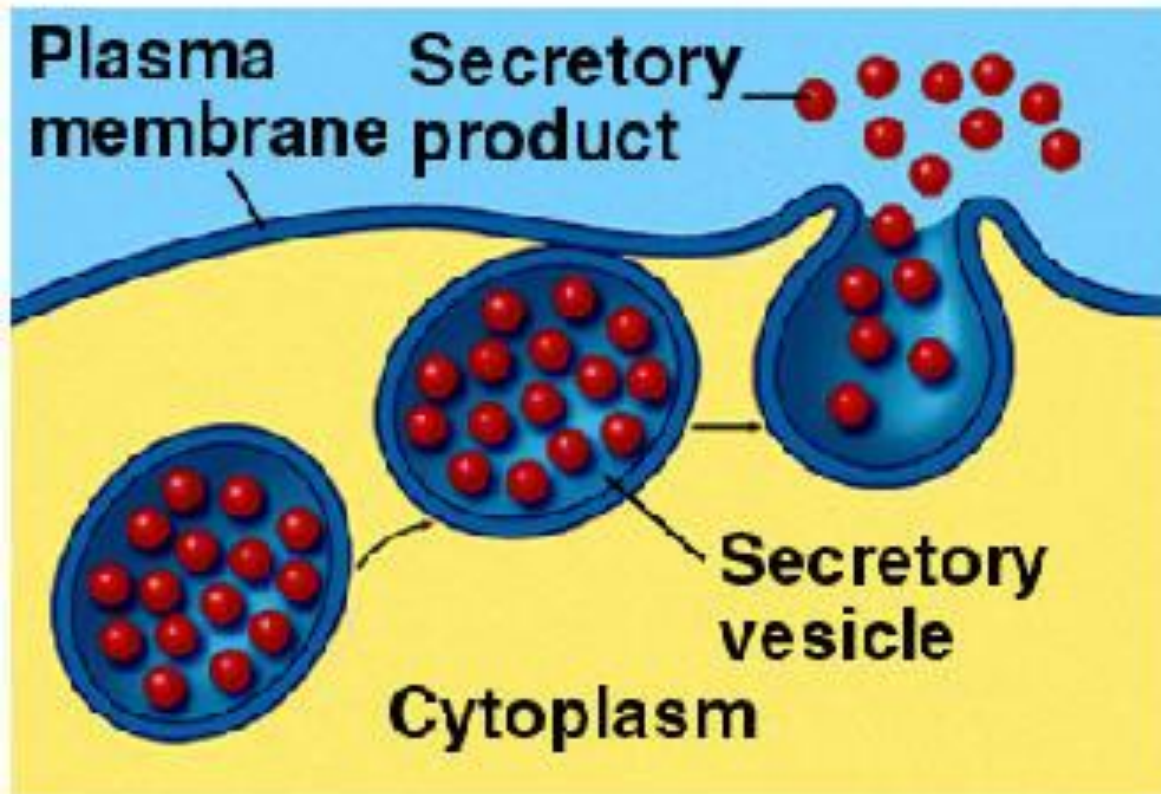


Exocytosis

- The secretion of large amounts of materials by the cell membrane
 - Contents of cell are forced or **expelled OUT**
 - Must use **energy & vesicles**
 - Example: waste

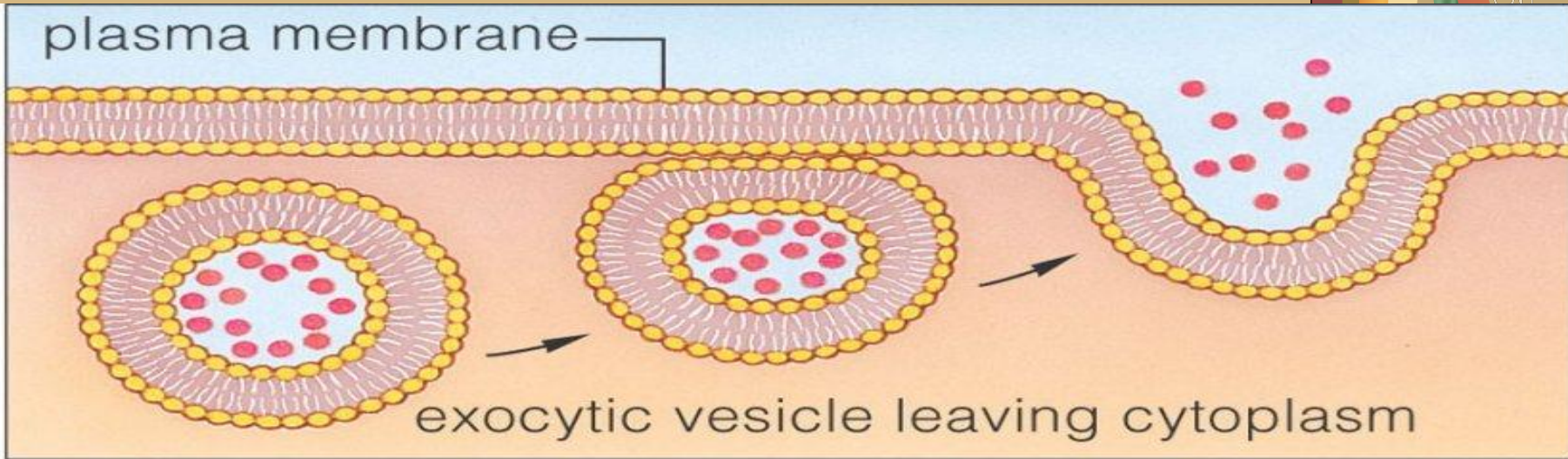


Exocytosis

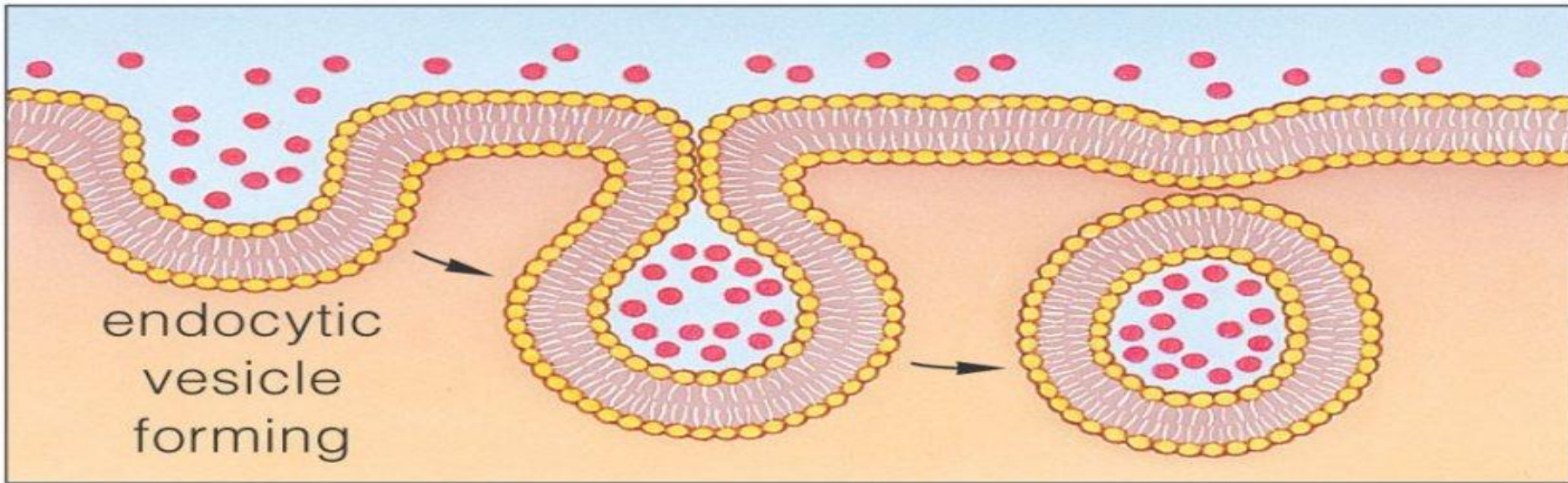


Endocytosis & Exocytosis

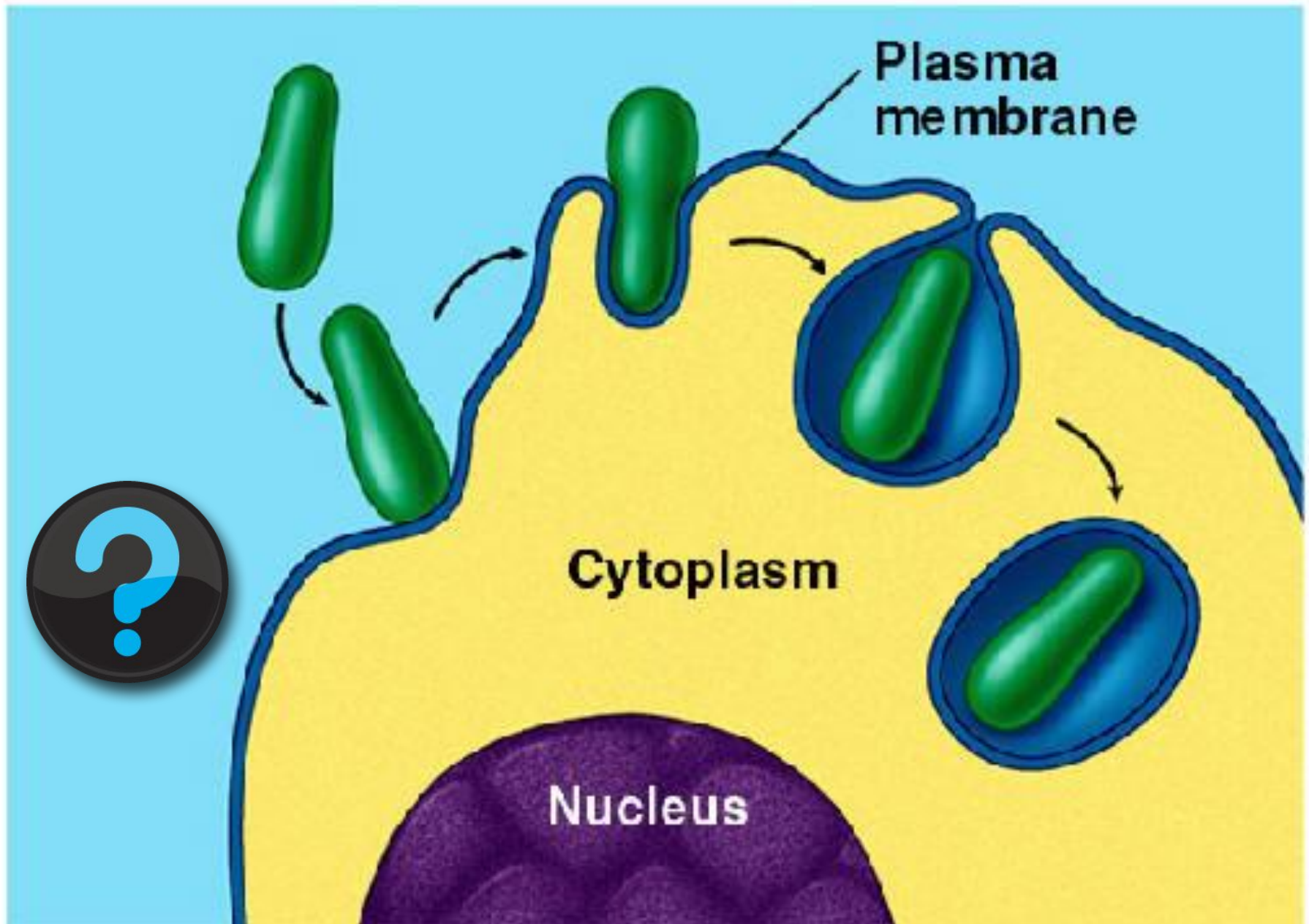
a



b



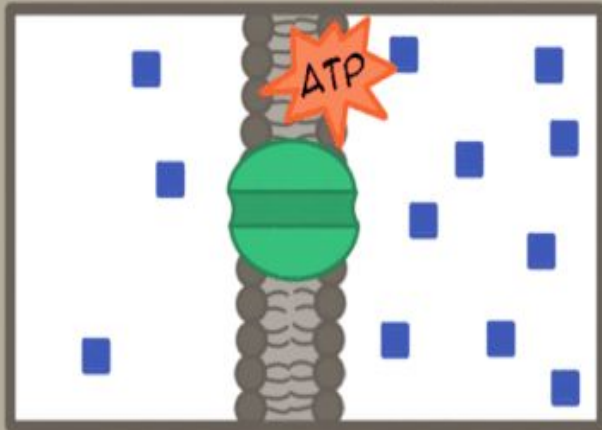
Endocytosis – Phagocytosis



CELL TRANSPORT @AmoebaSisters

Requires Energy

Active Transport

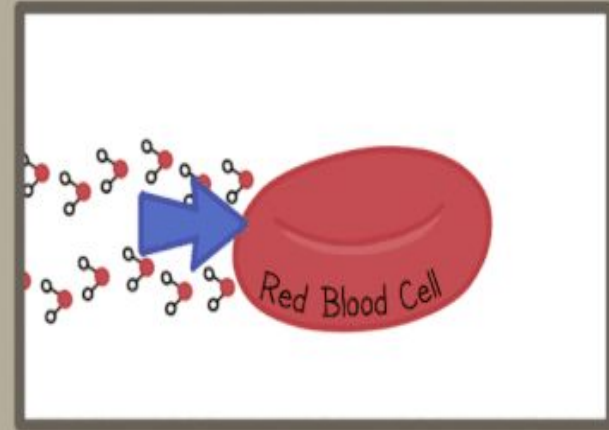


Bulk Transport (ex: Endocytosis)

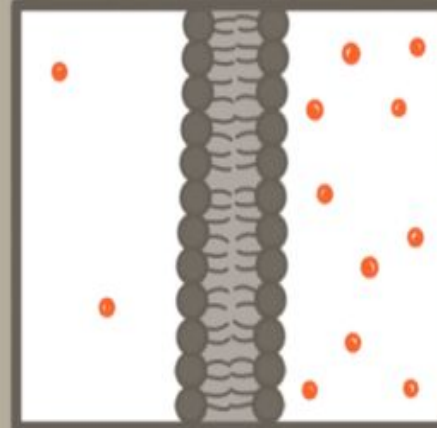


Does Not Require Energy
(Passive Transport)

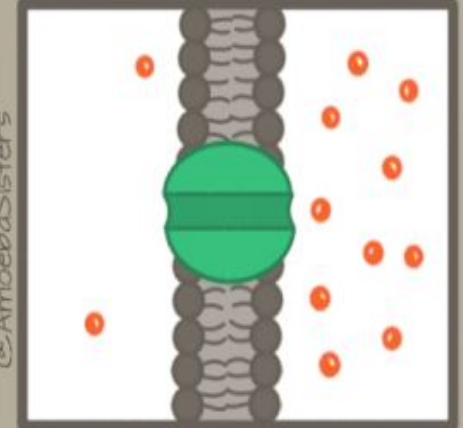
Osmosis



Diffusion



Facilitated Diffusion



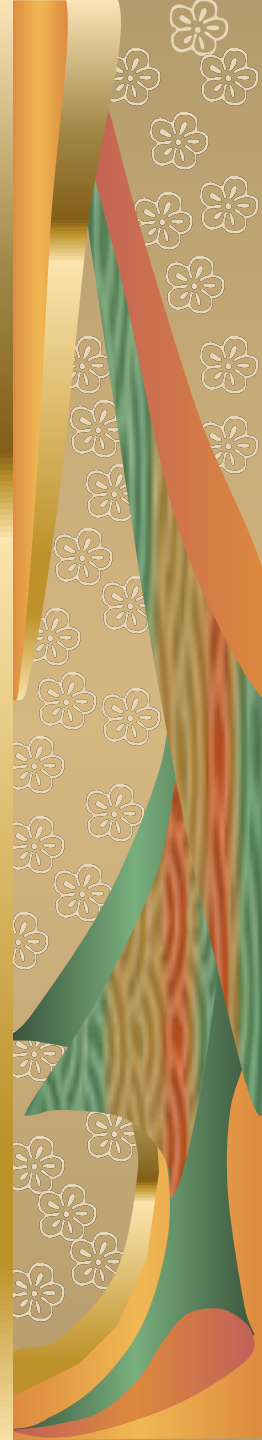
Homeostasis

- DEF: Maintaining constant internal physical and chemical conditions
- Unicellular organisms like yeast, prokaryotes, protists will
 - Grow
 - Reproduce
 - Respond to environment
 - Transform energy



Multicellular organisms will

- Communicate with each other
- Are specialized for particular tasks



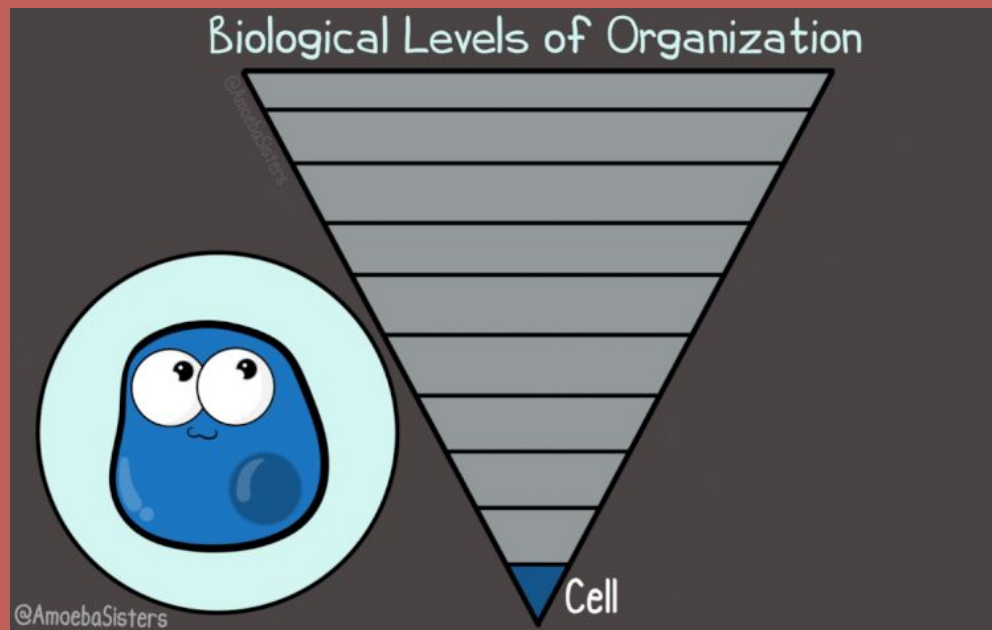
Division of Labor

- **CELL:** basic unit of life
- **TISSUE:** *group of similar cells working together to perform a task*
 - *Muscle tissue*
- **ORGAN:** *many tissues working together to perform a particular function*
 - *heart*
- **ORGAN SYSTEM:** *a group of organs working together to perform a specific function*
 - *Cardiovascular System*

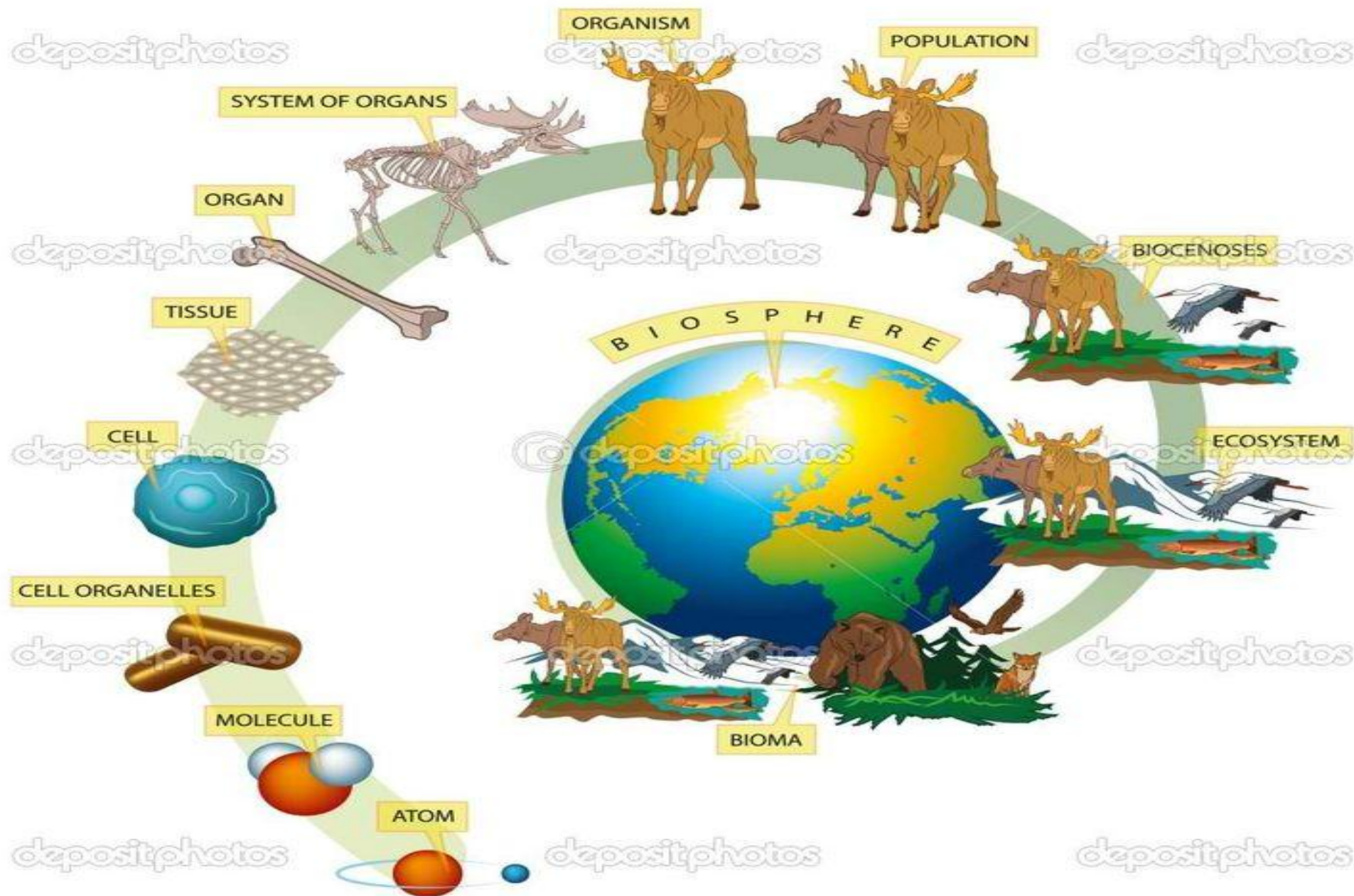


Division of Labor

- This allows organisms to maintain homeostasis because of interdependence and specialization



Division of labor



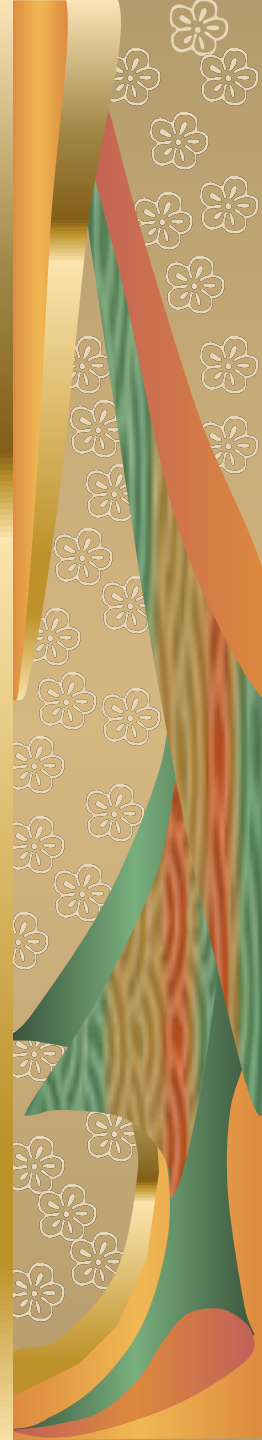
Cellular communication

- Cells in large organisms communicate by way of chemical signals
- These signals speed up activities or slow them down
- RECEPTORS: a signaling molecule binds so that a signal can be responded to
- Example: heart beat, nerve impulse, reaction (hand on stove)



Essential Questions

- What is the main differences between active and passive transport?
- What happens in a hypotonic, isotonic, and hypertonic cell?
- How do large particles enter and exit a cell?
- What is the difference between endocytosis and exocytosis?
- *Vocabulary: diffusion, equilibrium, facilitated diffusion, osmosis, hypotonic solution, isotonic solution, and hypertonic solution, active transport, endocytosis, exocytosis*





Homework Time

- Complete the passive worksheet –
 - Turn in if complete before bell
 - Take home and complete it

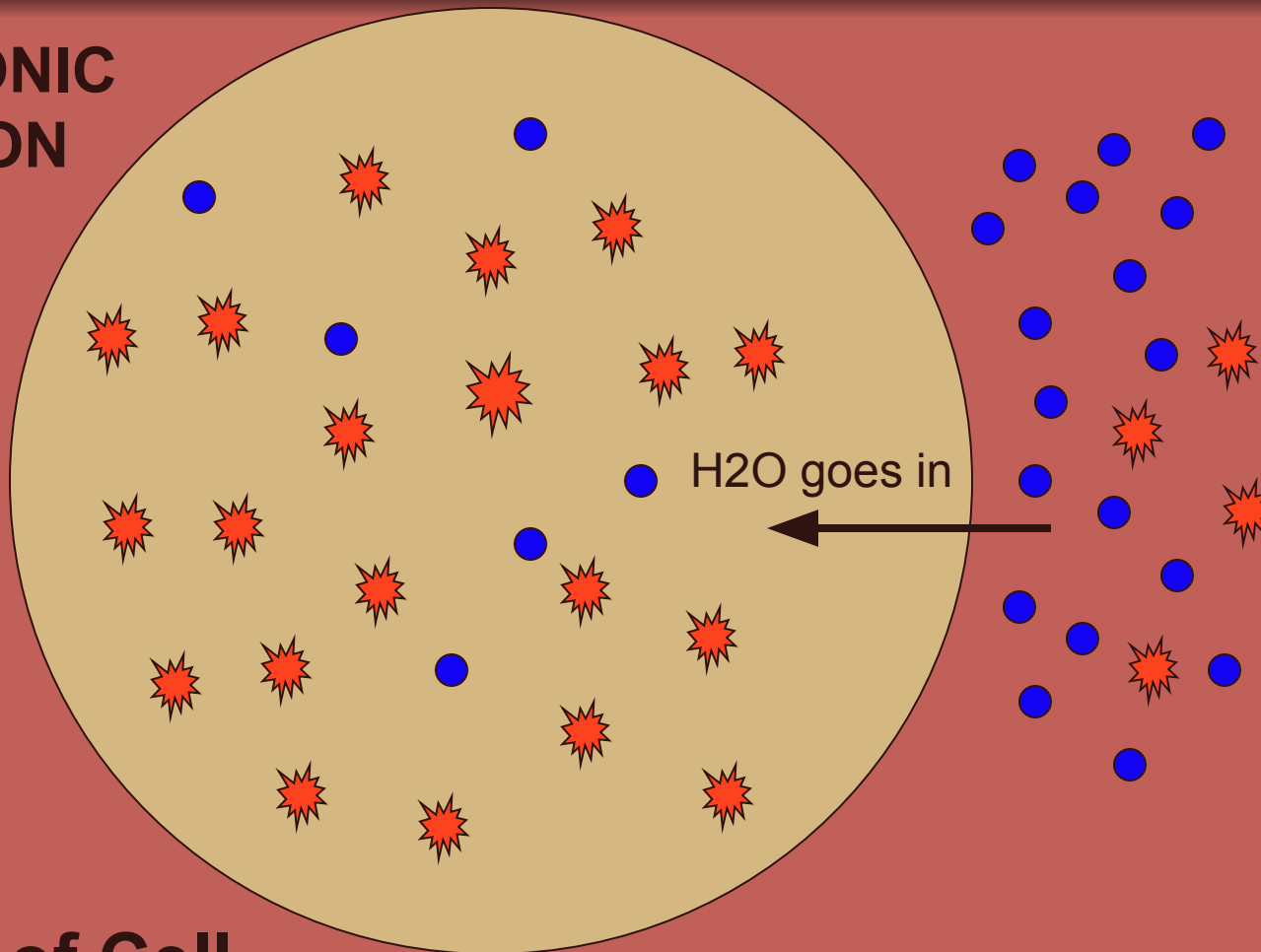


Journal pg 58 – Cell Transport Foldable

- Cut out the 6 types of cellular transport
- Paste on page 58
- Briefly describe each method
- Draw a picture of each



HYPOTONIC SOLUTION



Inside of Cell

- Solute **HIGH**
- Water **LOW**
- Means **Hypertonic solution**

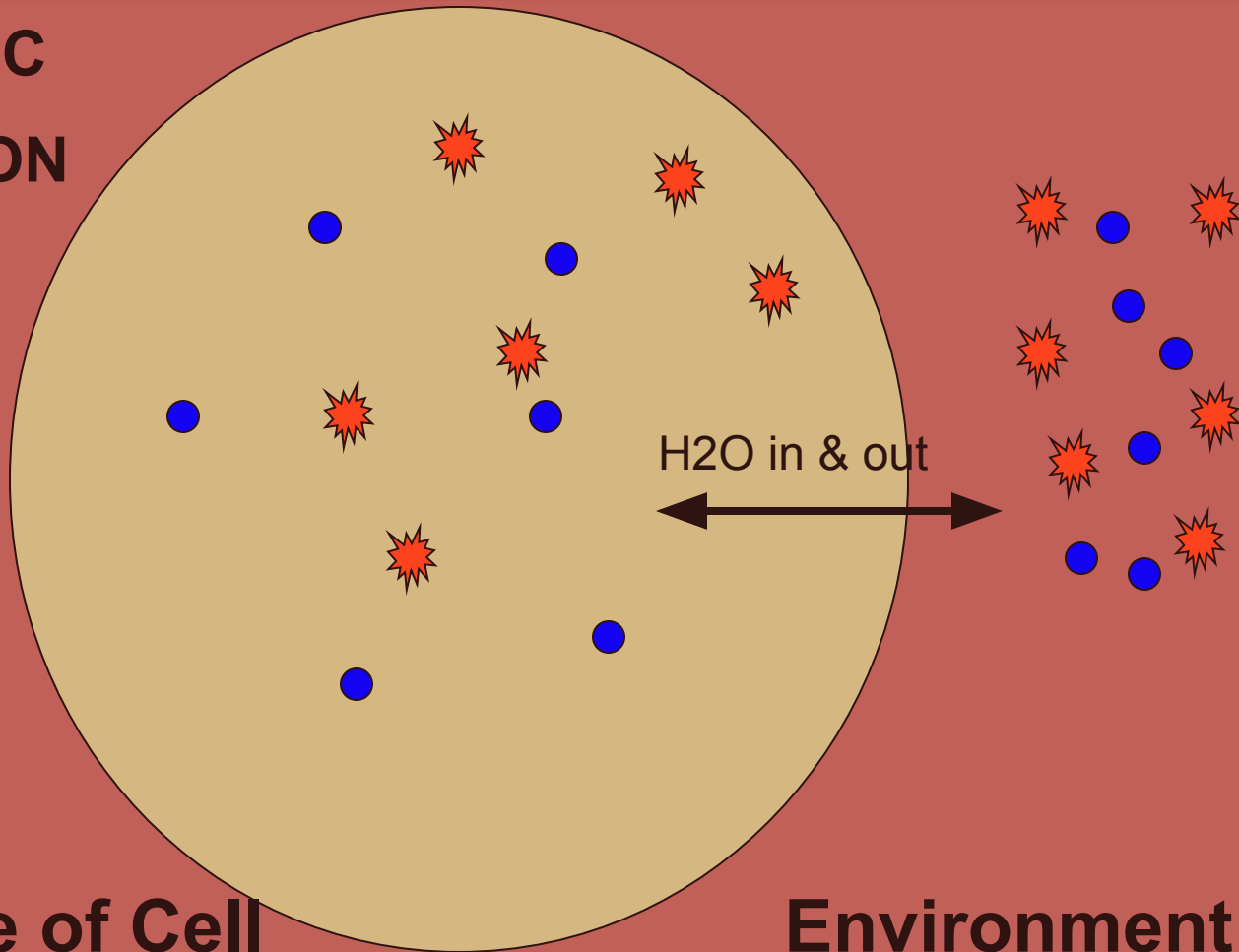
RESULT OF CELL:
it will **swell**

Environment

Solute **LOW**
Water **HIGH**
Means: **Hypotonic solution**



ISOTONIC SOLUTION



BEST
place for
an animal
cell

Inside of Cell

- Solute **equal**
- Water **equal**
- Means: **Isotonic solution**

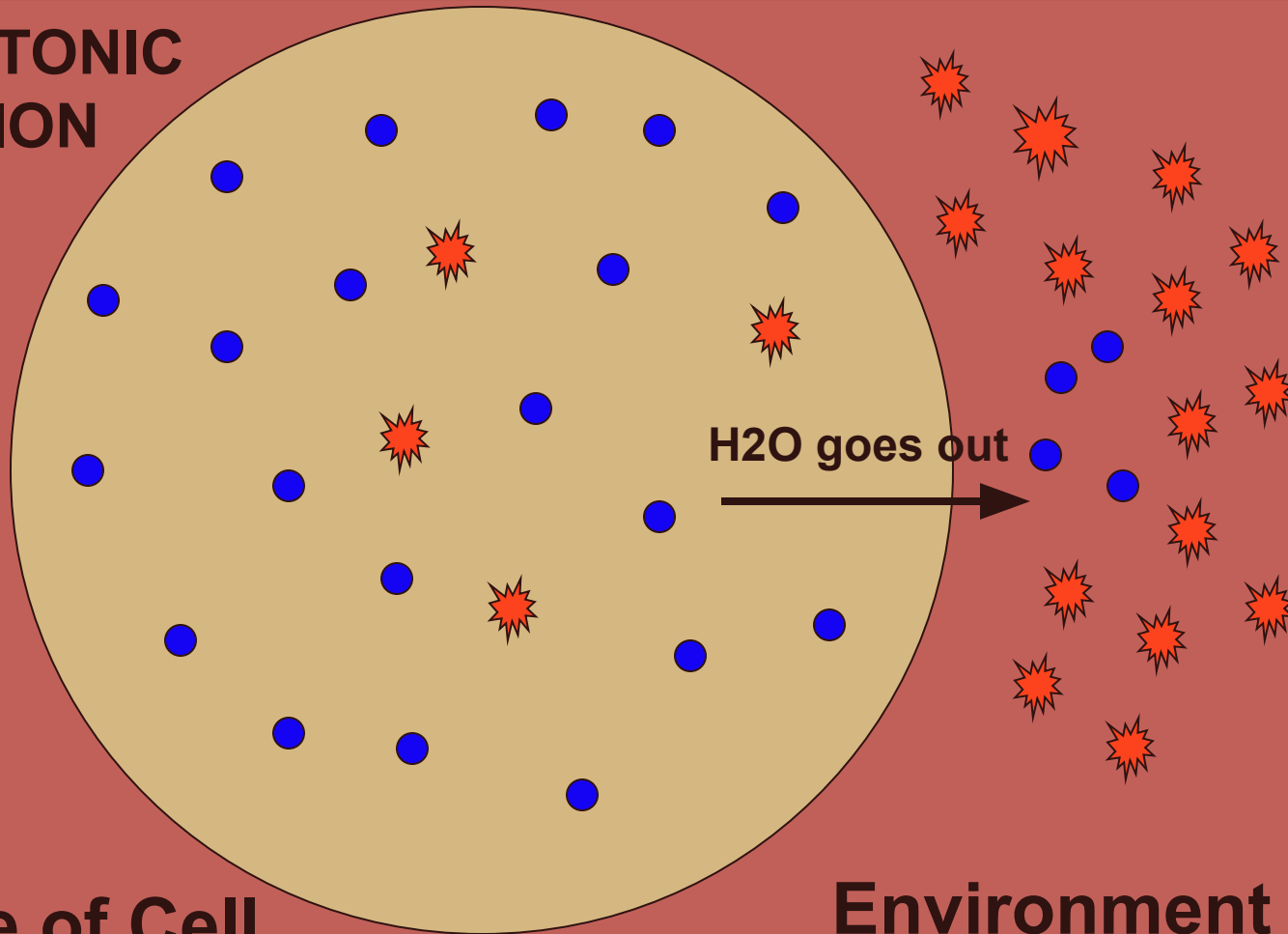
RESULT OF
CELL:
stays the
same

Environment

Solute **equal**
Water **equal**
Means: **Isotonic solution**



HYPERTONIC SOLUTION



Inside of Cell

- Solute **LOW**
- Water **HIGH**
- Means **Hypotonic solution**

RESULT OF CELL:
it will **shrink**

Environment

Solute **HIGH**
Water **LOW**
Means: **Hypertonic solution**

