11/30/18

CELL TRANSPORT: POGIL

DO NOW

- Study for quiz for 3 minutes

AGENDA

- Quiz (15 min)
- Membrane Structure and Function POGIL
- Share out

QUIZ

- You will have 15 minutes to complete the quiz
- When you are finished, flip the quiz over AND DO NOT COMMUNICATE WITH OTHER STUDENTS (verbal and nonverbal)

POGIL

- Questions 1- 17
- You have 30 min

SHARE OUT

- Spokesperson:
  - One key idea that your team learned
  - Provide specific example
- Process Analyst:
  - Did everyone in your table contribute equally to the answer?
  - What can you all do to improve in this area?

TURN IT IN!

- Only turn in the report.
- Do not lose the POGIL!!!

DO NOW

- What is the job of the plasma membrane?
- What is the difference between polar and non-polar molecules?

DIFFUSION, OSMOSIS AND ACTIVE TRANSPORT LAB

PART A: DIFFUSION

GOAL: ANNOTATE AND ANSWER QUESTIONS 1-5

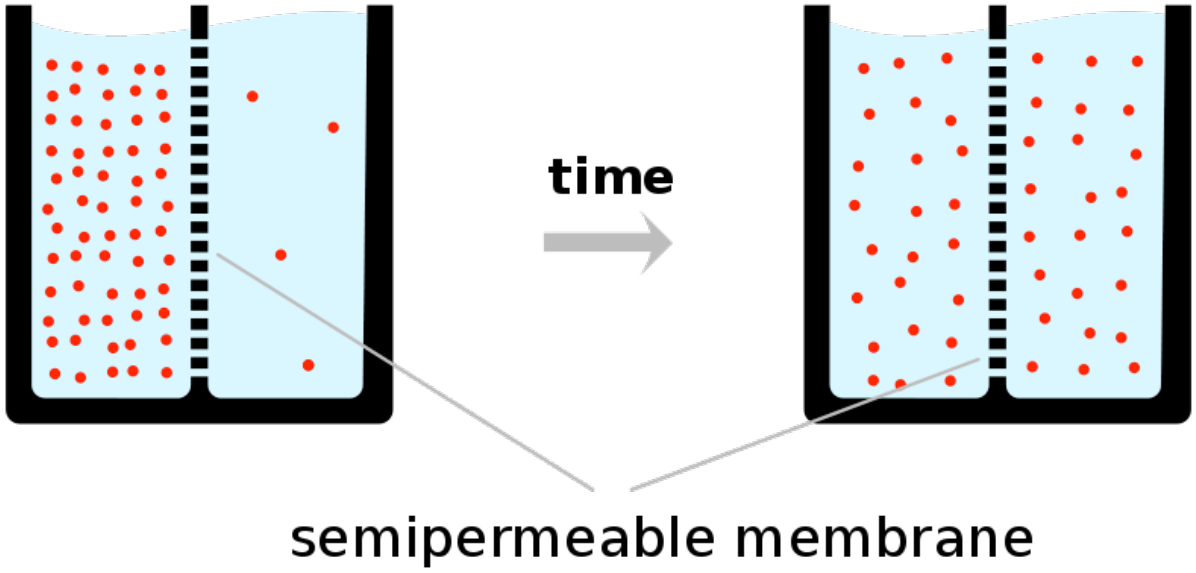
YOU HAVE 10 MIN

PAGE 67 (CORNELL NOTES TITLE)

CELL TRANSPORT: DIFFUSION

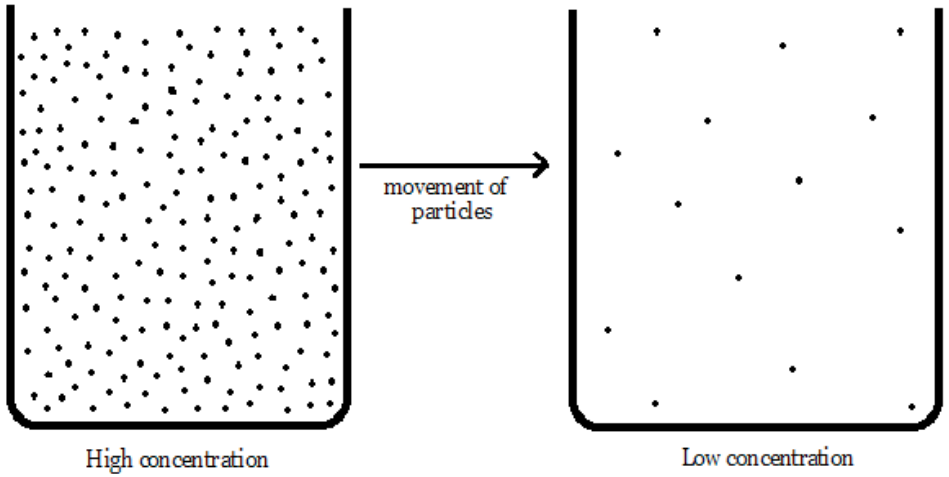
DIFFUSION

- Movement of molecules from a region of high concentration to low concentration



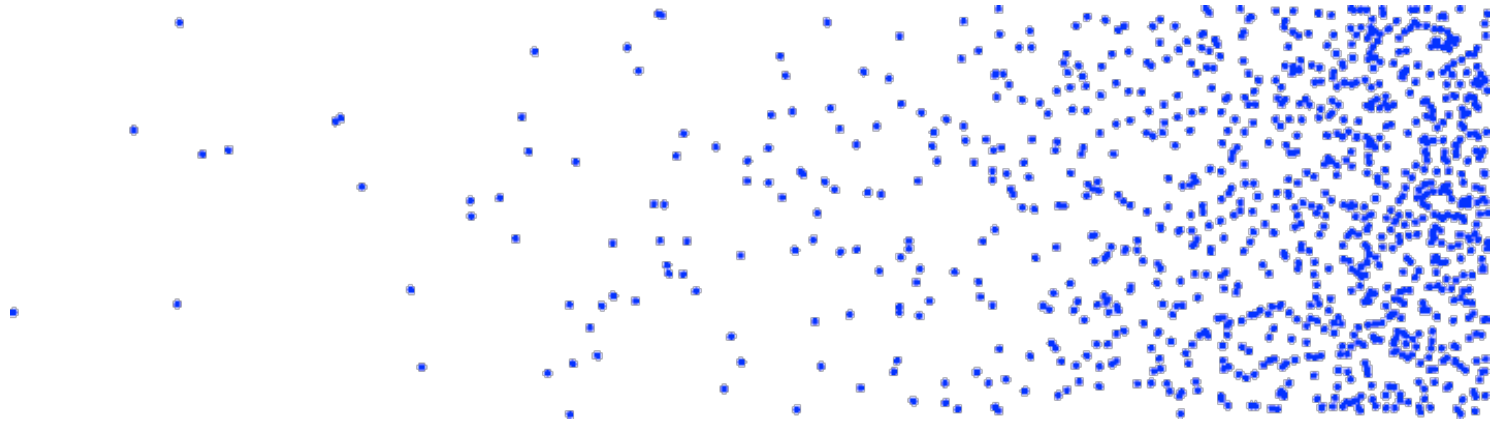
CONCENTRATION

- Number of molecules of a substance in a given volume
  - High concentration - more particles per volume
  - Low concentration - less particles per volume



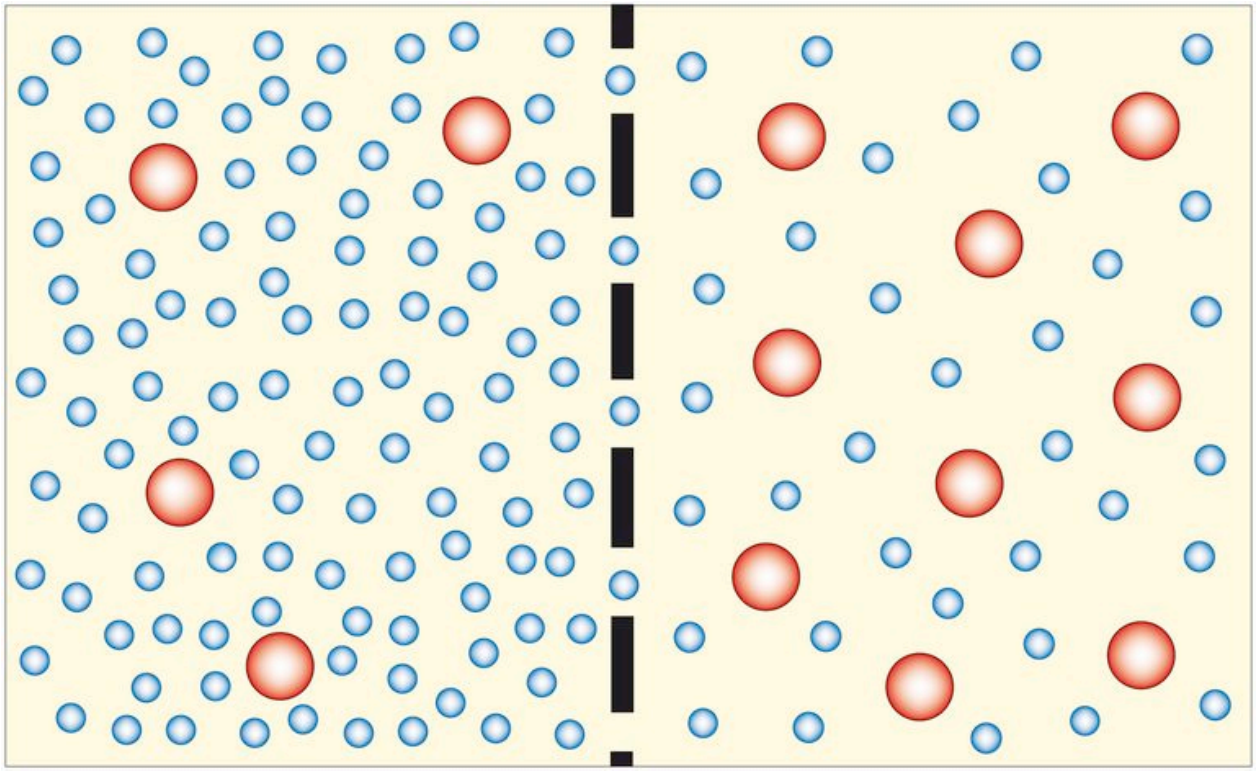
CONCENTRATION GRADIENT

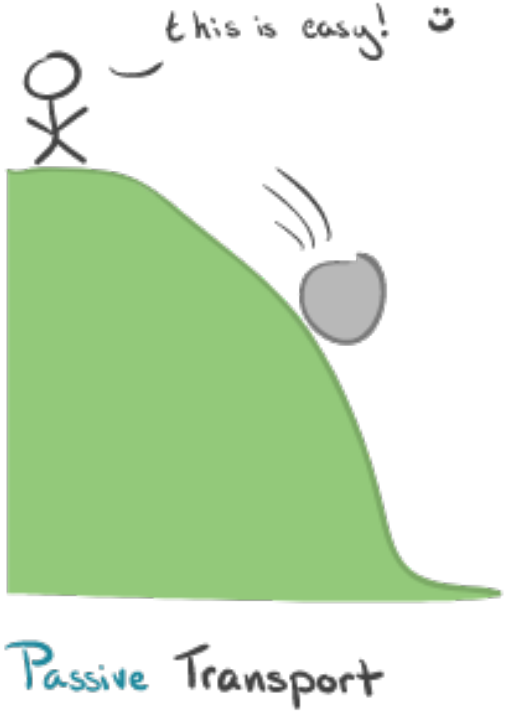
- Difference in concentration of a substance from one location to another
- Molecules diffuse **down** their concentration gradient



PASSIVE TRANSPORT

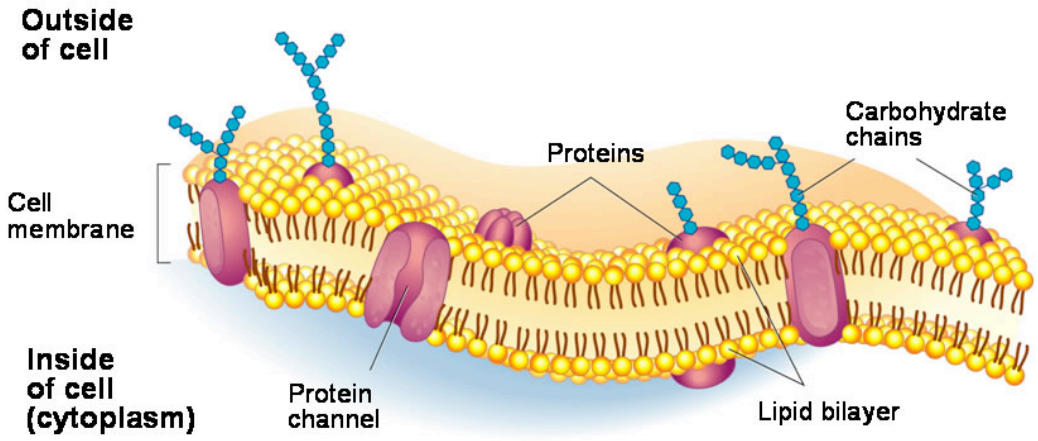
- Movement of molecules across a cell membrane **without energy input**
- Diffusion of molecules across a membrane





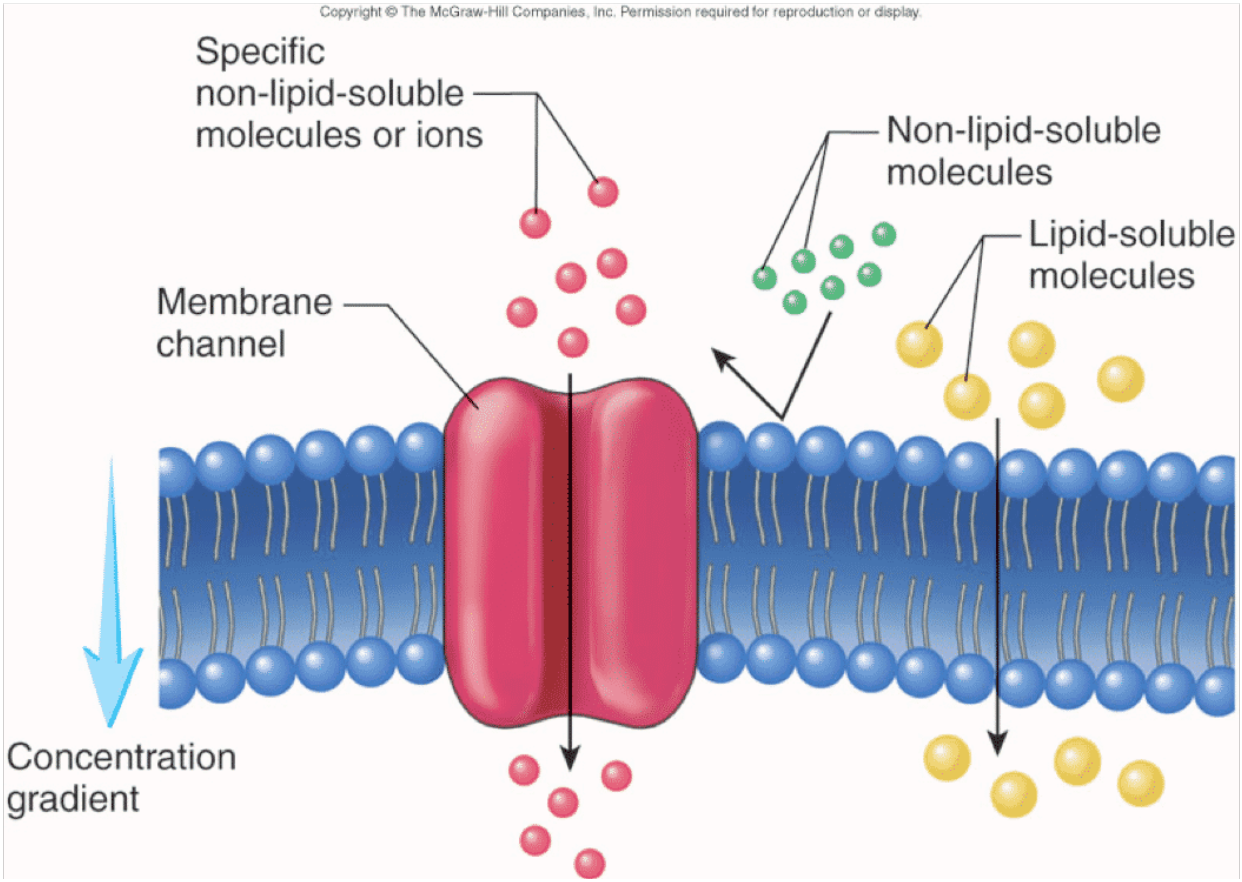
PLASMA MEMBRANE

- Boundary of cell
- Ensures only specific molecules enter or leave
- Made of 2 layers of phospholipids (polar head and non-polar tail)
  - lipid bilayer



WHAT CAN DIFFUSE ACROSS A MEMBRANE?

- Small lipids and non-polar molecules (such as CO_2 and O_2)

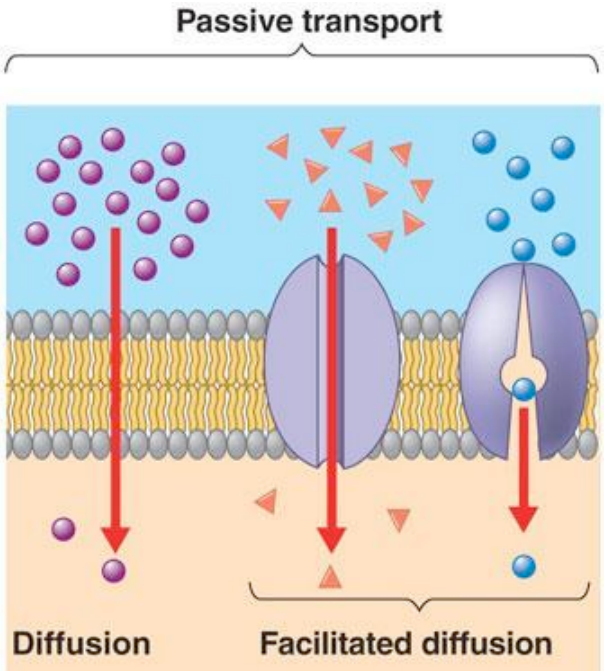


WHAT ABOUT OTHER MOLECULES? LARGER LIPIDS? POLAR MOLECULES?

FACILITATED DIFFUSION

- "to make easier"
- Diffusion of molecules across a membrane through transport/channel proteins
- Form of passive transport

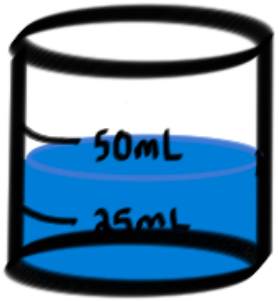
WHY?



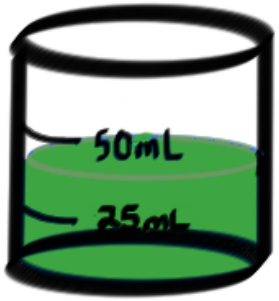
PARTS OF A SOLUTION

SOLUTE + SOLVENT = SOLUTION

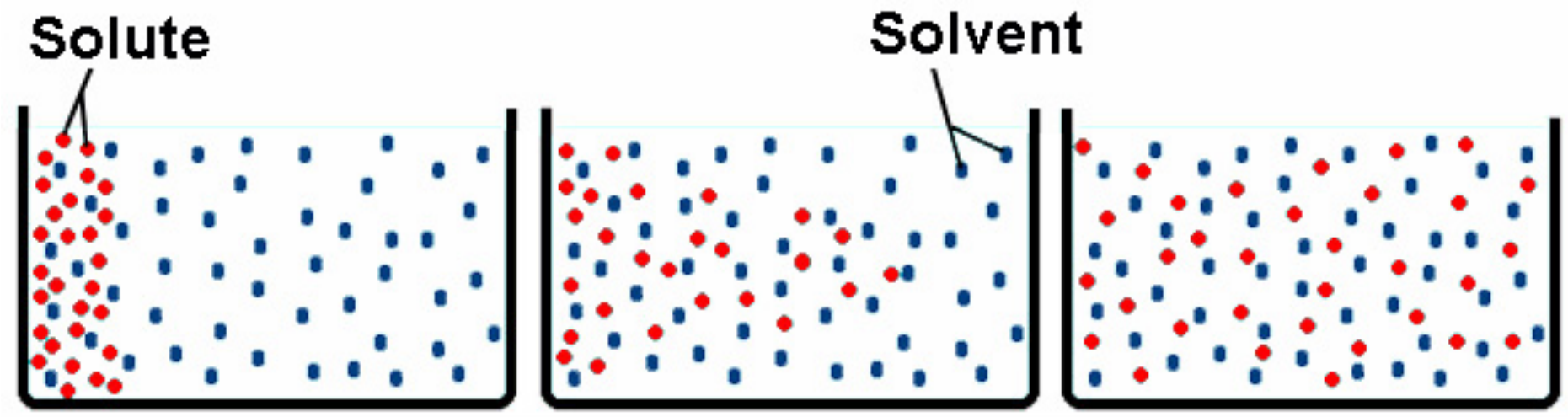
what's being dissolved



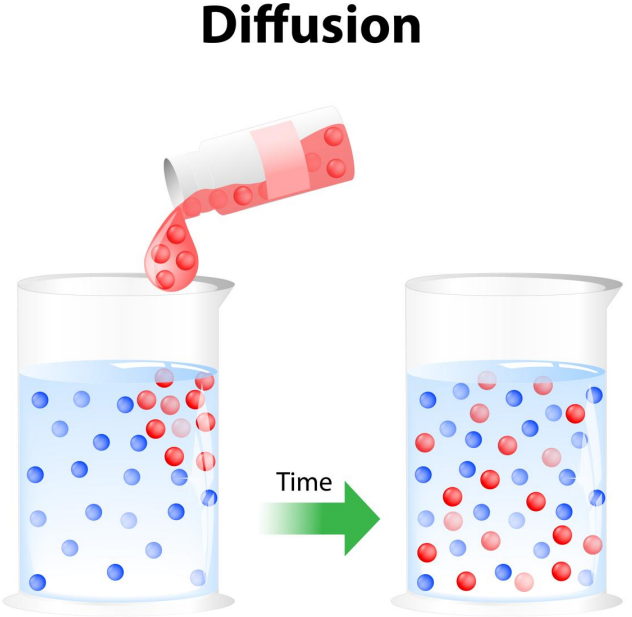
what's doing the dissolving



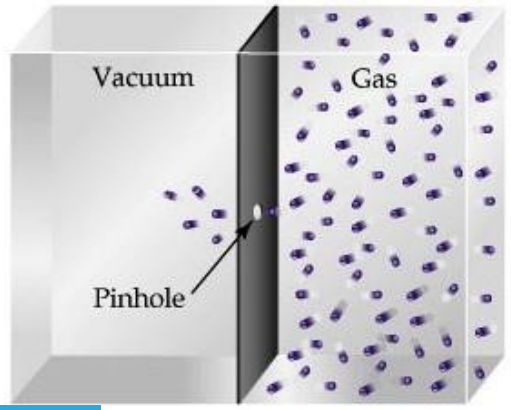
Are both the blue and red particles dissolving?

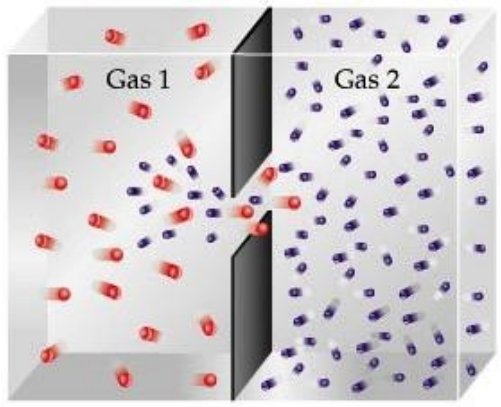


NO, ONLY THE RED PARTICLE IS DISSOLVING BECAUSE IT HAS A CONCENTRATION GRADIENT. THE BLUE PARTICLE HAS REACHED EQUILIBRIUM

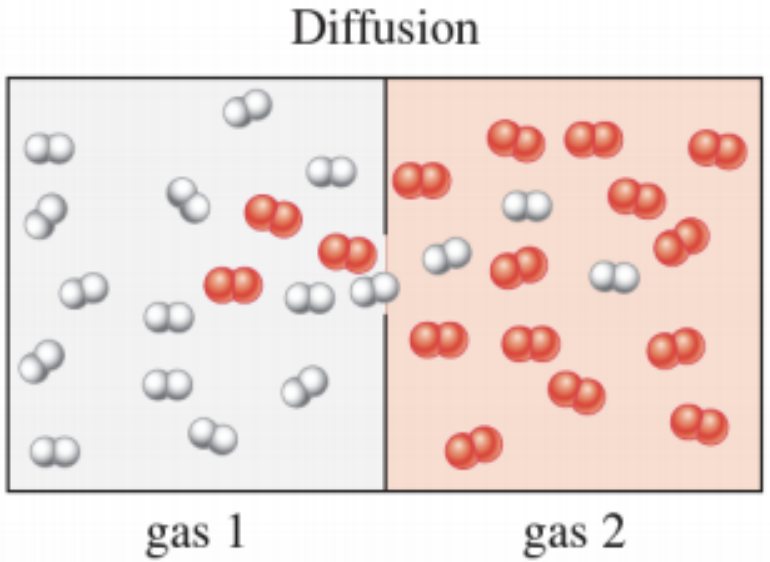


Can more than one type of molecule dissolve simultaneously?

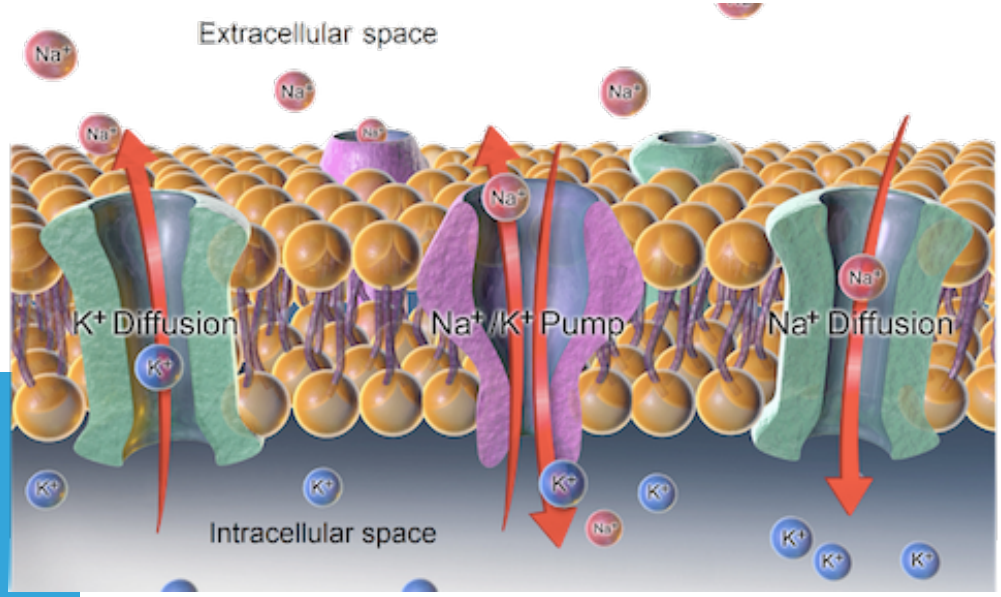




YES, AS LONG AS EACH MOLECULE HAS NOT REACHED EQUILIBRIUM. EACH TYPE OF MOLECULE WILL DISSOLVE INDIVIDUALLY FROM EACH OTHER



How can the cell membrane act like a gate?



DEPENDS ON:
-MOLECULAR SIZE
-POLARITY
-CHANNEL PROTEINS

ILLUSTRATIVE SUMMARY PAGE 66

COMPLETE THE SUMMARY ON PAGE 66

DIFFUSION – ILLUSTRATED SUMMARY

- Create a diagram/picture/flow chart that summarizes ALL of today's notes
- Use at least 4 colors
- Label as necessary

HOMEWORK

- CELL TRANSPORT: DIFFUSION WORKSHEET

12/4/18

CELL TRANSPORT: OSMOSIS

DO NOW

- Answer questions 6-9 from “Diffusion, osmosis and active transport lab (dry)”

AGENDA

- Diffusion, Osmosis and Active Transport Lab (Dry) - Part B
- ARGUMENTATION
- Presentations
- Reflection

DIFFUSION, OSMOSIS AND ACTIVE TRANSPORT LAB

PART B: OSMOSIS

GOAL: ANNOTATE & ANSWER QUESTIONS 10-12B

TEXT

ARGUMENTATION SESSION

OSMOSIS CASE STUDY

GOAL 1: GENERATE A VALID ARGUMENT (WITH EVIDENCE)

GOAL 2: VERIFY THE VALIDITY OF OTHER'S ARGUMENTS AND THEIR PROPER USE OF EVIDENCE

HINTS

- Biconcave disk = normal shape of red blood cell
- NaCl = salt
- Saline = solution with salt
- Distilled water = water ONLY. No salt
- Blood pressure = overall volume of solution in blood

12/5/18

CER CASE STUDY

DO NOW

- ANNOTATE OSMOSIS CASE STUDY
    - COMPLETE THE BACK SIDE IF YOU HAVEN'T DONE SO ALREADY
- TAKE OUT PACKET

HINTS

- Biconcave disk = normal shape of red blood cell
- NaCl = salt
- Saline = solution with salt
- Distilled water = water ONLY. No salt
- Blood pressure = overall volume of solution in blood

ARGUMENTATION SESSION

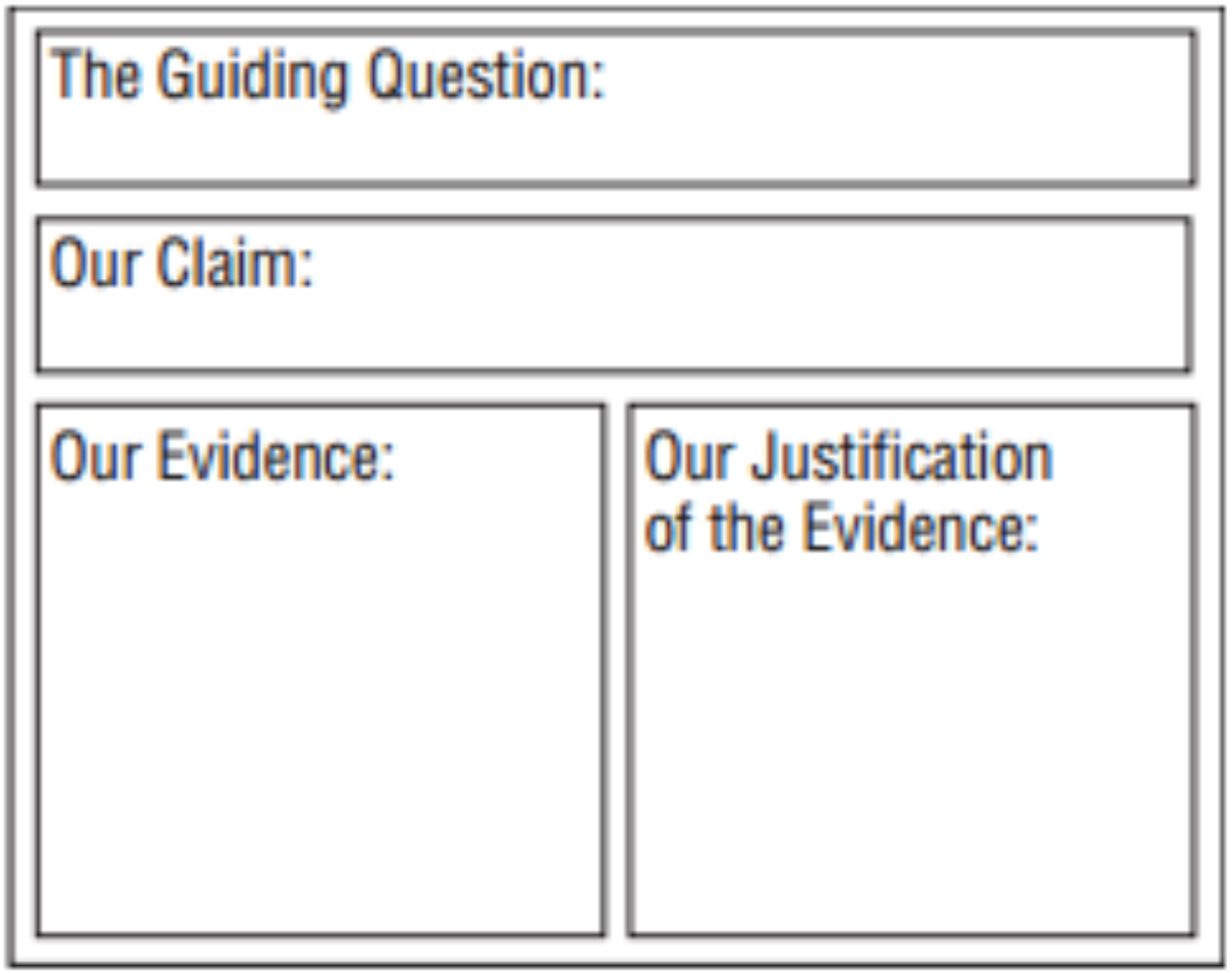
OSMOSIS CASE STUDY

GOAL 1: GENERATE A VALID ARGUMENT (WITH EVIDENCE)

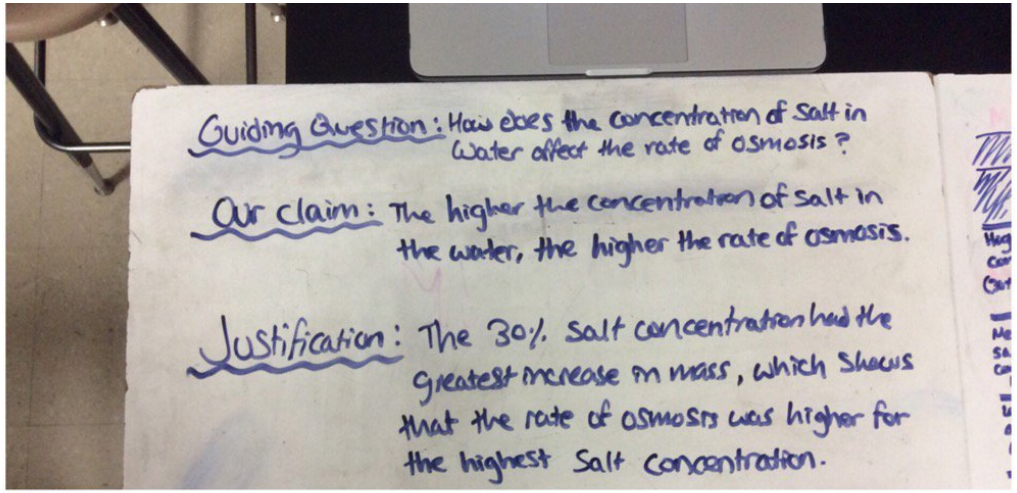
GOAL 2: VERIFY THE VALIDITY OF OTHER'S ARGUMENTS AND THEIR PROPER USE OF EVIDENCE

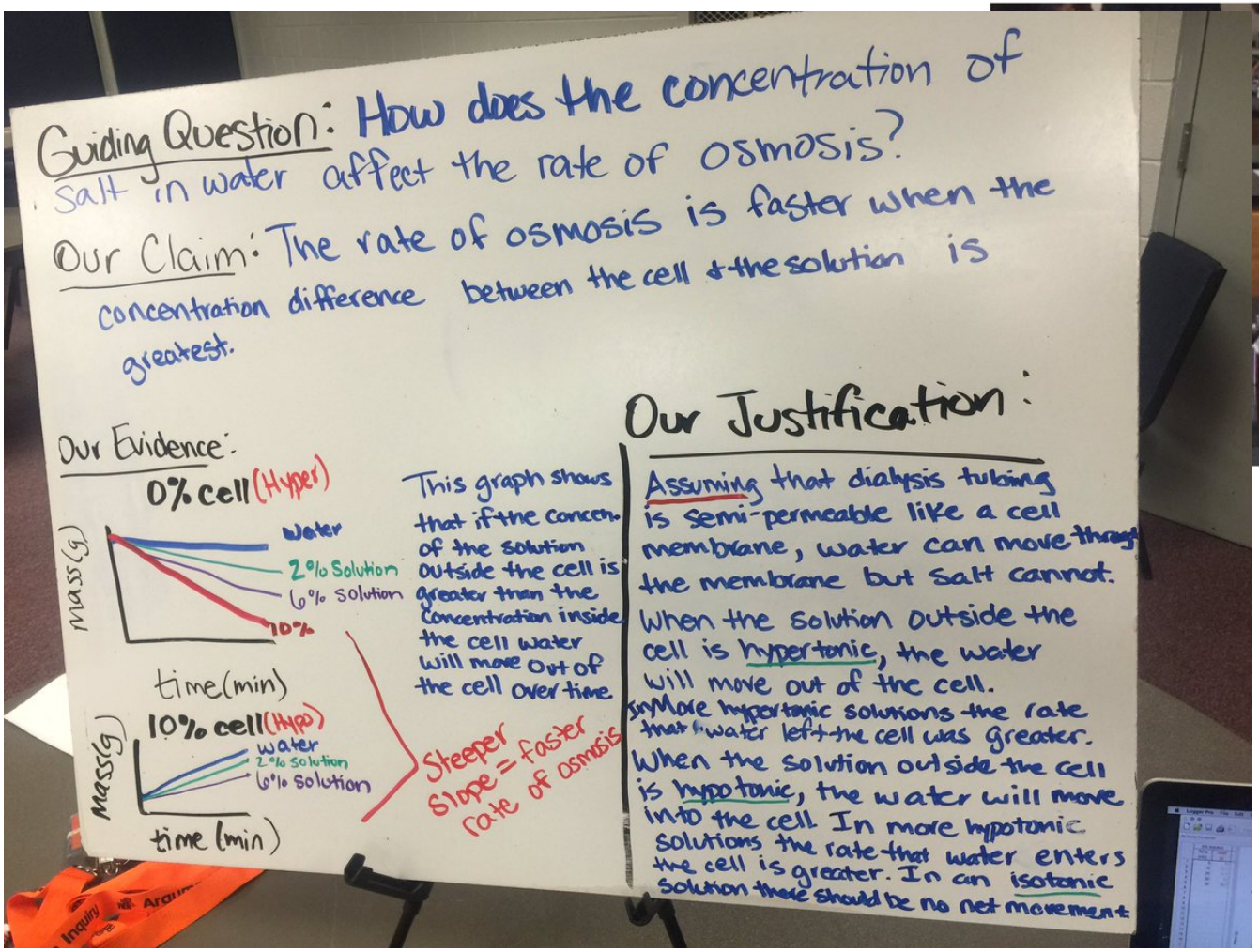
TASK 1: GENERATE AN ARGUMENT

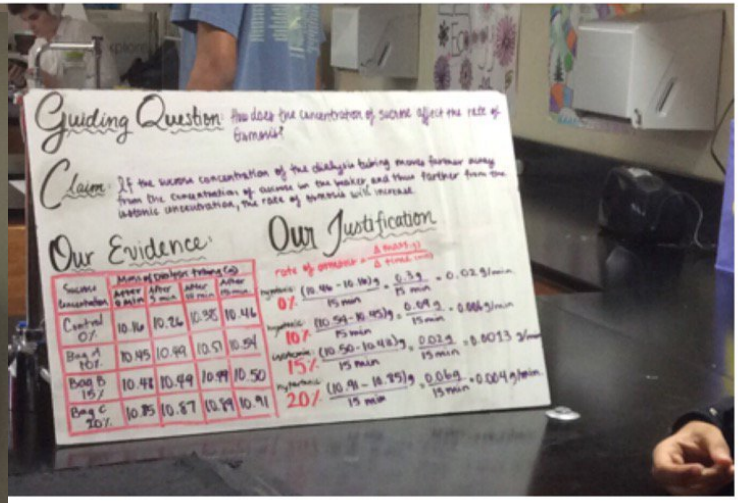
Argument presentation on a whiteboard



TASK 1: GENERATE AN ARGUMENT







QUESTION: WHAT SHOULD LIAM DO TO INCREASE THE PATIENT'S BLOOD PRESSURE?

- 10 min

GOAL 1: GENERATE AN ARGUMENT WITH EVIDENCE

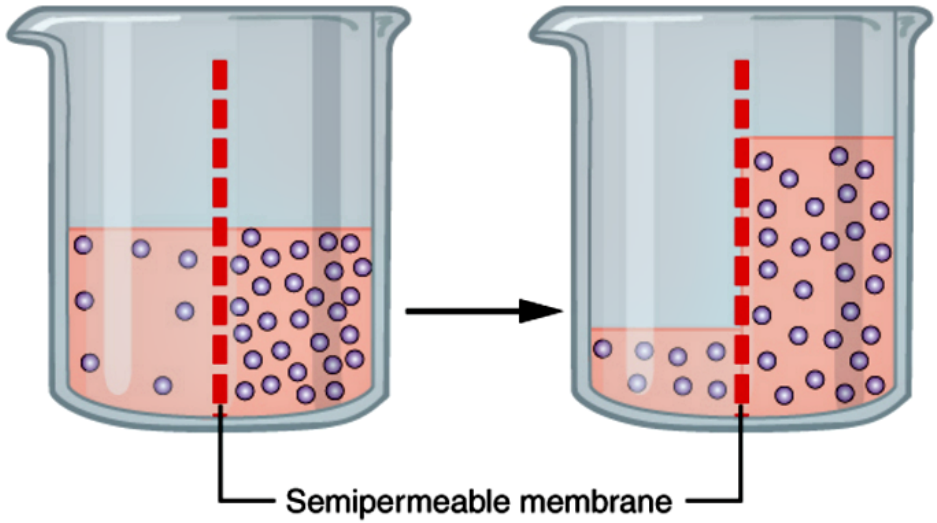
- Criteria
  - **Evidence**
    - Include data from the dry lab "Diffusion, osmosis & Active Transport"
  - **Reasoning**:
    - Use at least 3 of the following vocabulary terms: diffusion, osmosis, isotonic, hypotonic, hypertonic, solutes, concentration
    - Explain HOW the evidence proves the claim to be true (link the evidence and the claim)

PAGE 69 (CORNELL NOTES TITLE)

CELL TRANSPORT: OSMOSIS

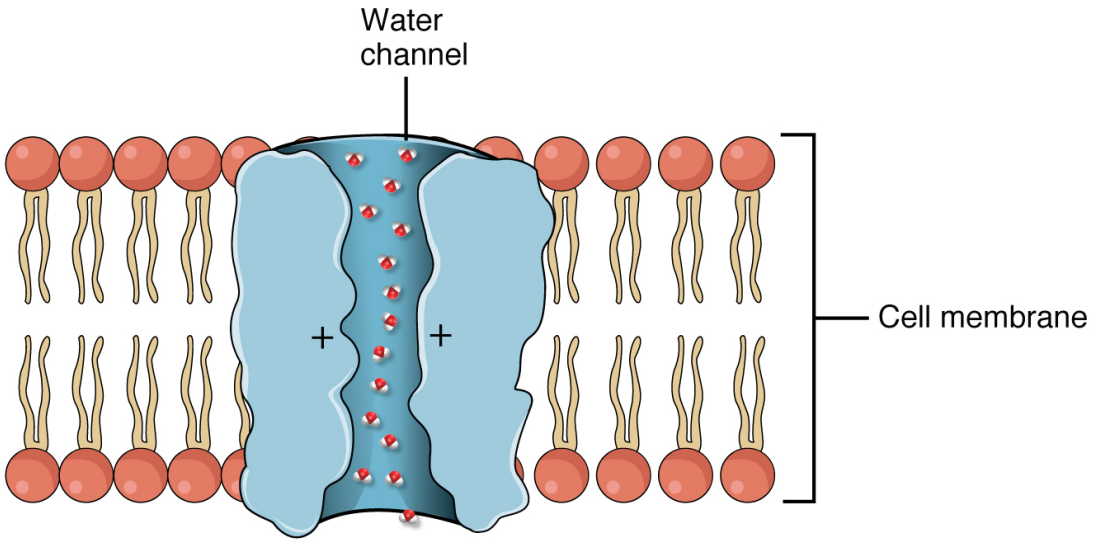
OSMOSIS

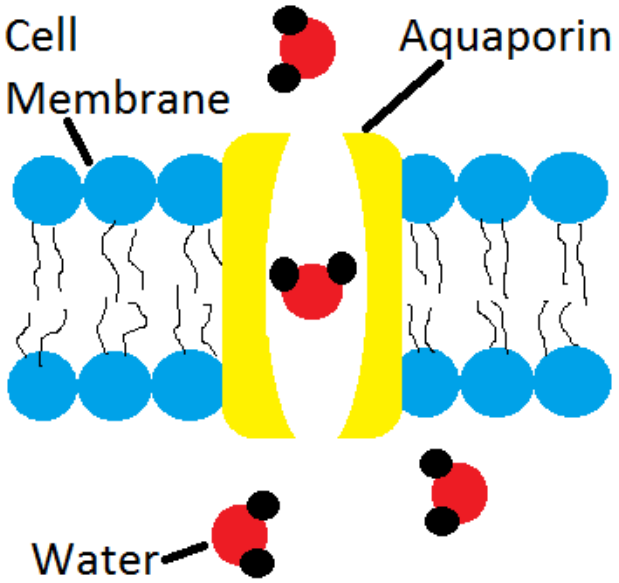
- Diffusion of water molecules from a region of low solute concentration to high solute concentration
- Form of facilitated diffusion (uses a transport protein called aquaporin)



AQUAPORIN

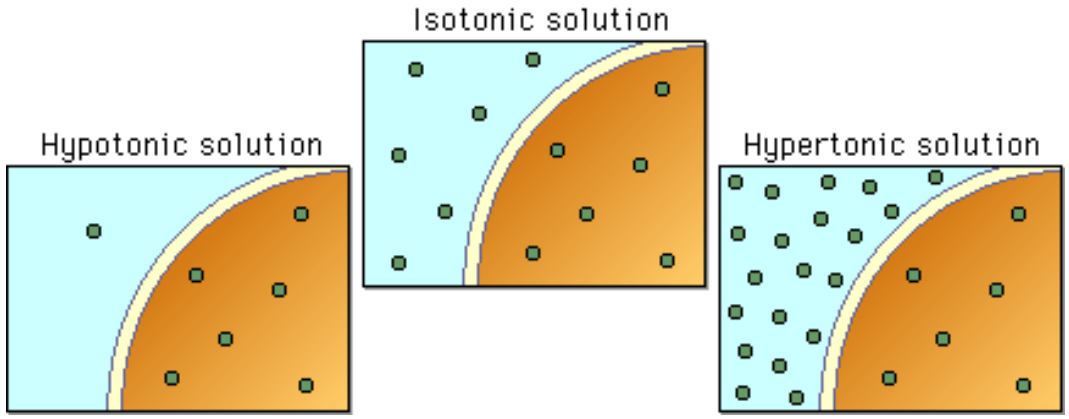
- Transport protein embedded in cell membrane
- Allows water to travel through the membrane





3 WAYS TO DESCRIBE A SOLUTION (OUTSIDE THE CELL)

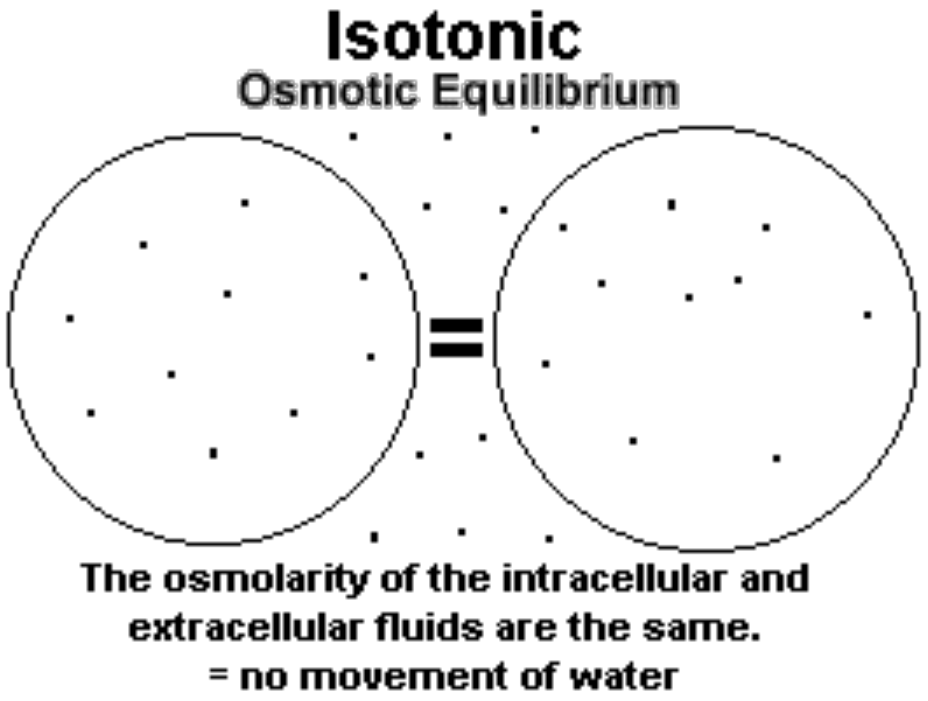
- The description is relative to another solution
  - Isotonic
  - Hypertonic
  - Hypotonic



- These terms are comparisons. They require a point of reference.

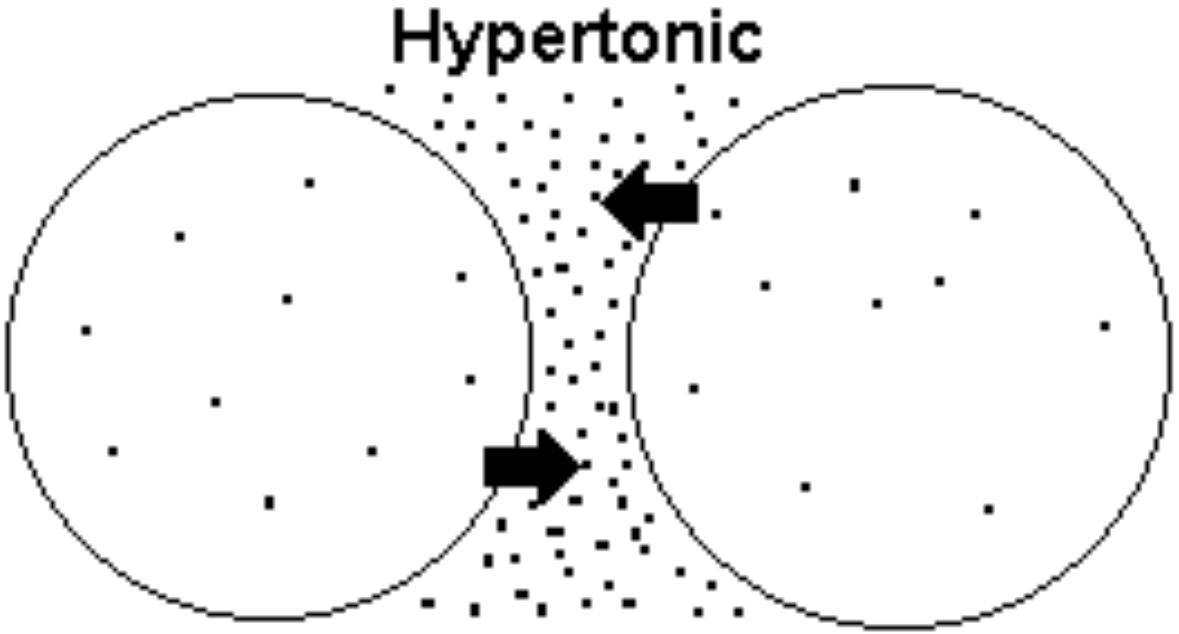
ISOTONIC SOLUTION

- Has a solute concentration **equal** to the solute concentration inside a cell



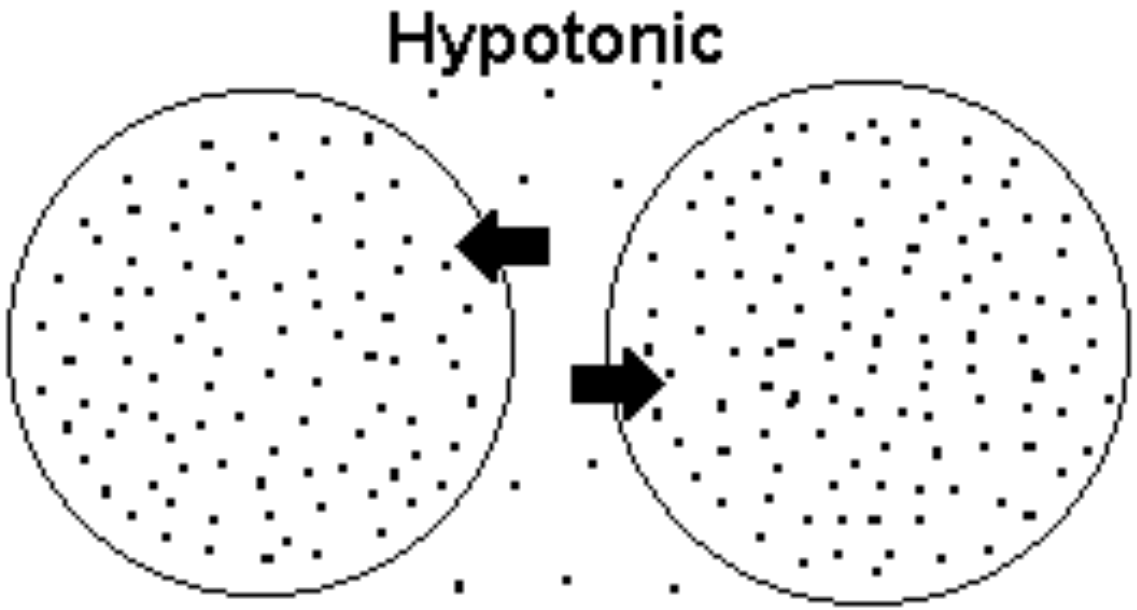
HYPERTONIC SOLUTION

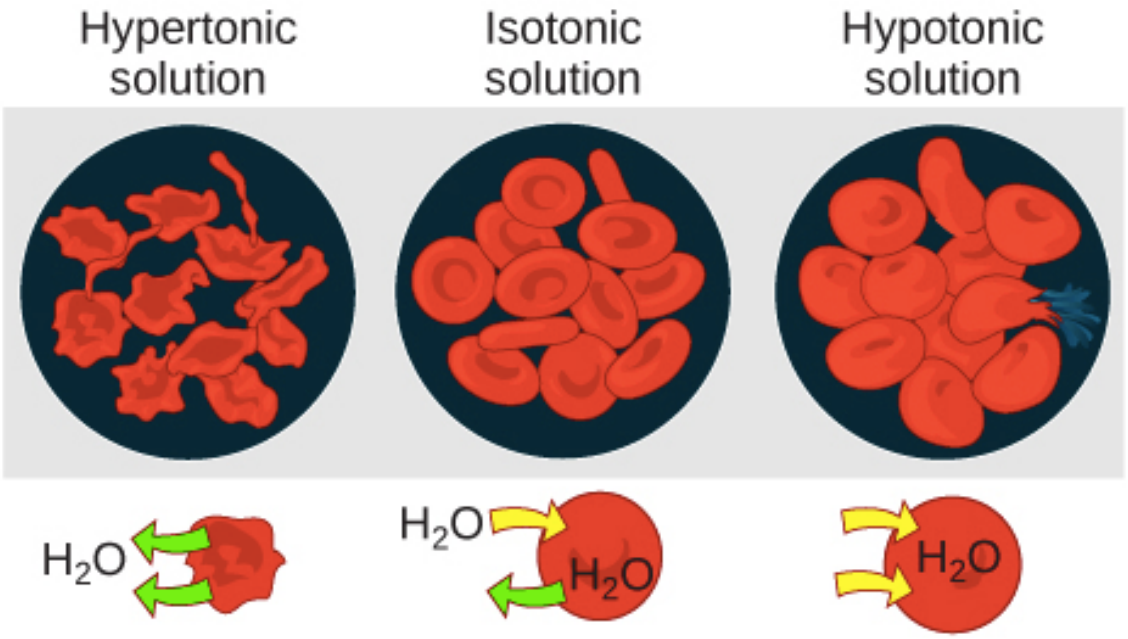
- Has a solute concentration **higher** than the solute concentration inside a cell

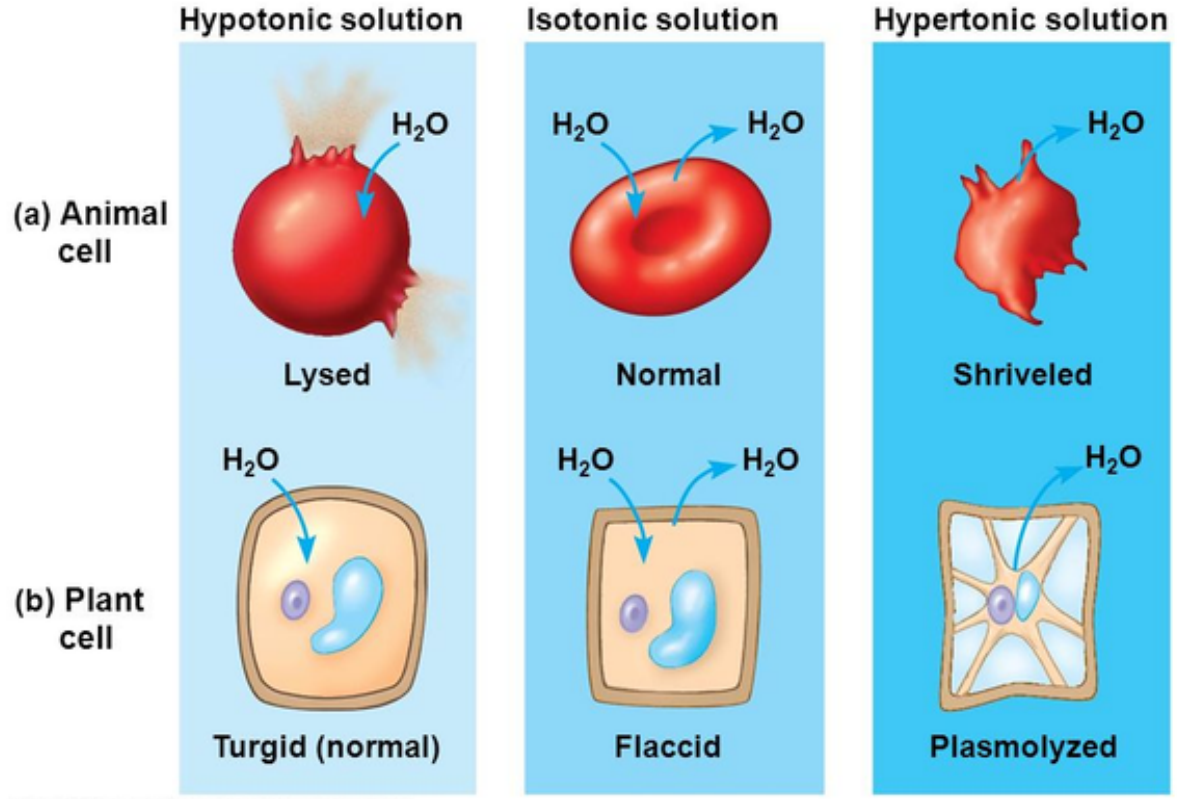


HYPOTONIC SOLUTION

- Has a solute concentration **lower** to the solute concentration inside a cell







OSMOSIS CASE STUDY DEBRIEF

PAGE 68 – ILLUSTRATED SUMMARY

12/6/18

CELL TRANSPORT: ACTIVE TRANSPORT

DO NOW

- There is 0.5M glucose inside the cell and 0.8M glucose outside the cell. Where will glucose move?
- In an hypertonic solution, will water enter or leave the cell?
- If the inside of the cell has 0.5M solutes and the outside has 0.2M solutes, where will water flow?

- **ANSWER QUESTIONS 13-14C on Part B of packet**

PART B DEBRIEF

PART C: ACTIVE TRANSPORT

GOAL: ANNOTATE AND ANSWER REMAINING QUESTIONS

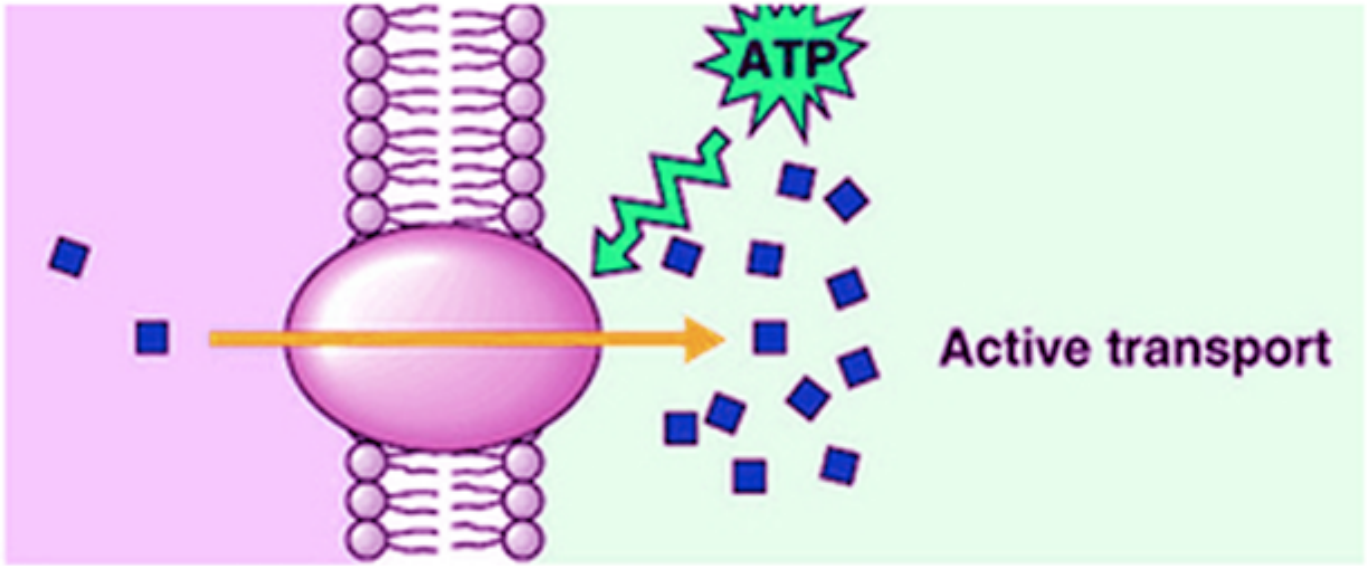
PAGE 71 (CORNELL NOTES TITLE)

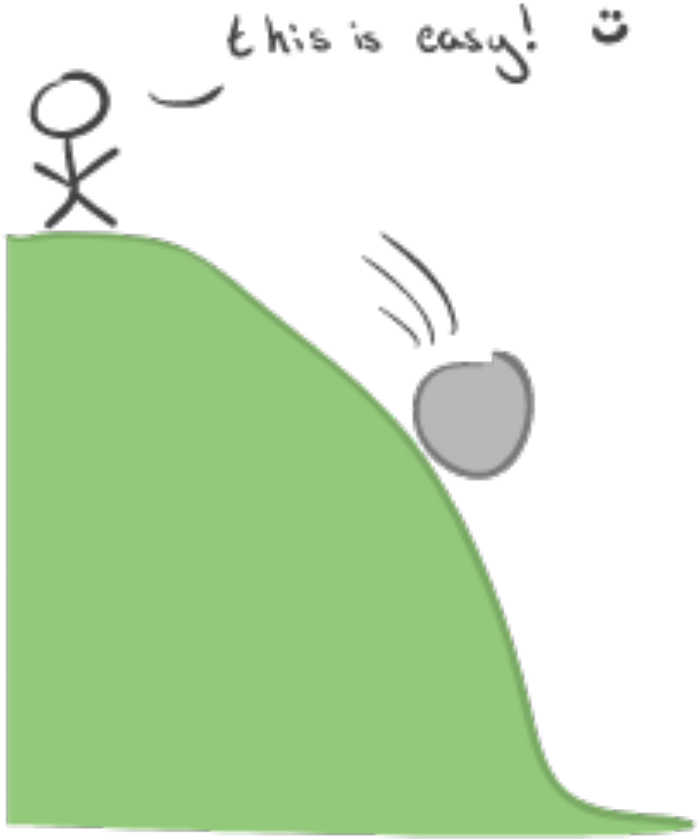
CELL TRANSPORT: ACTIVE TRANSPORT

FOCUS QUESTION: WHAT'S NEEDED TO BOARD THE TRAIN?

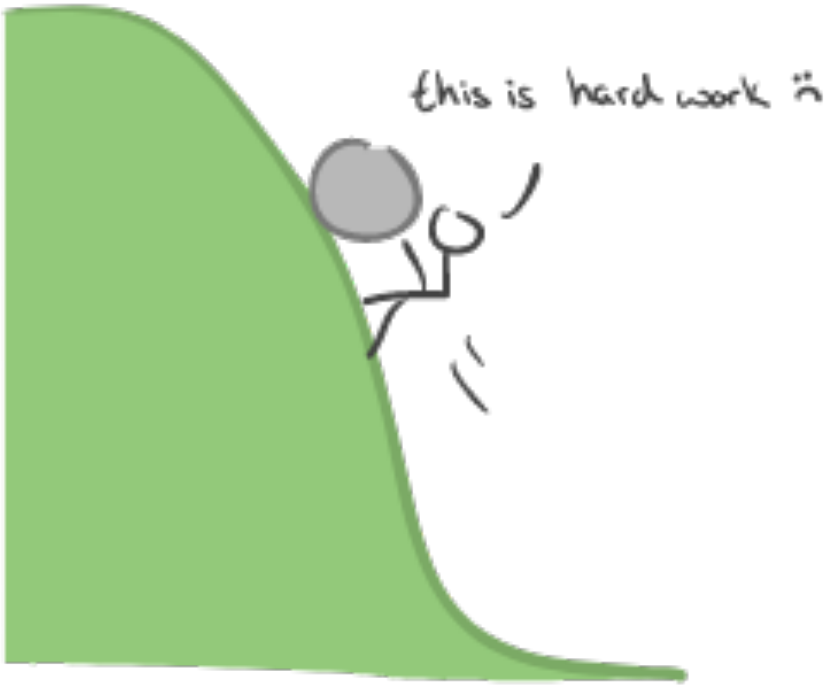
ACTIVE TRANSPORT

- Moving molecules across a membrane from a region of **low** concentration to high concentration (**against** the concentration gradient)
- Requires input of energy (ATP)





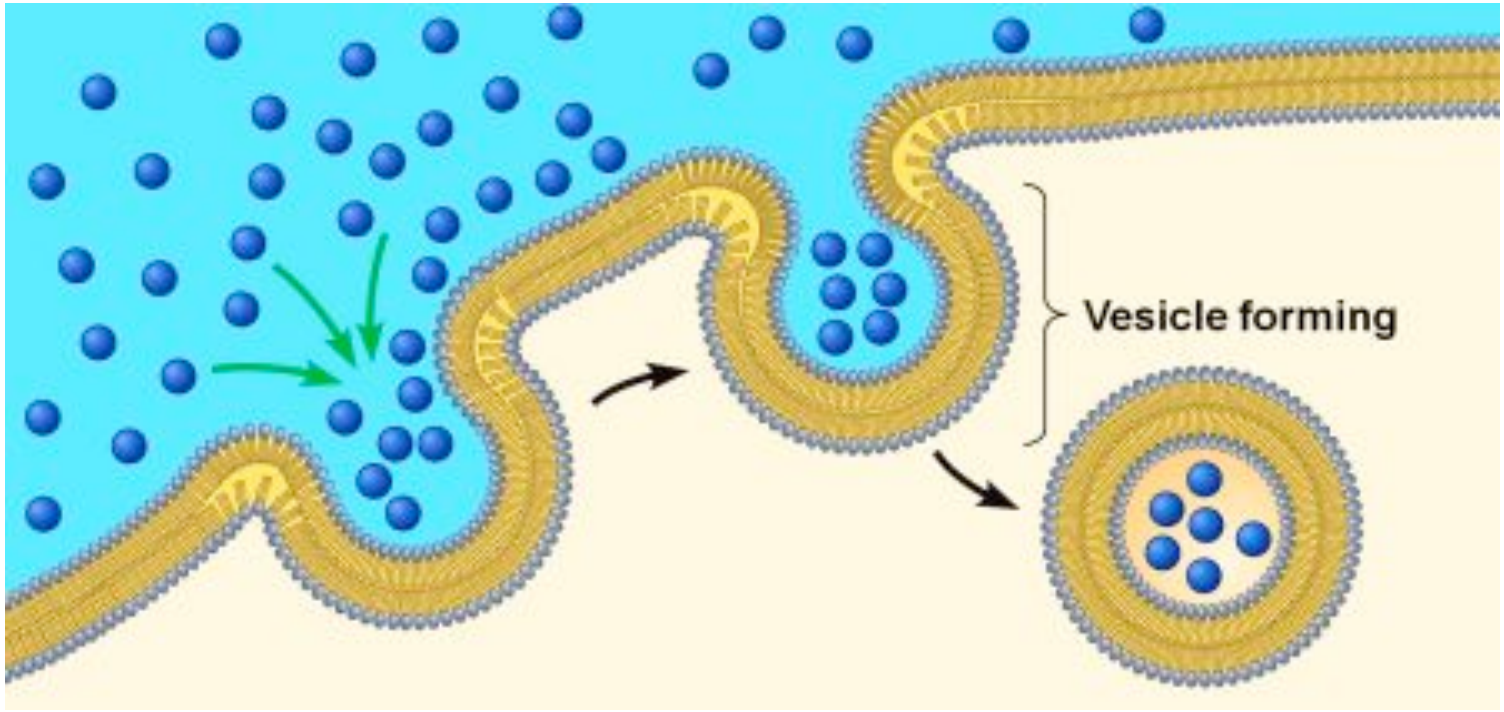
Passive Transport



Active Transport

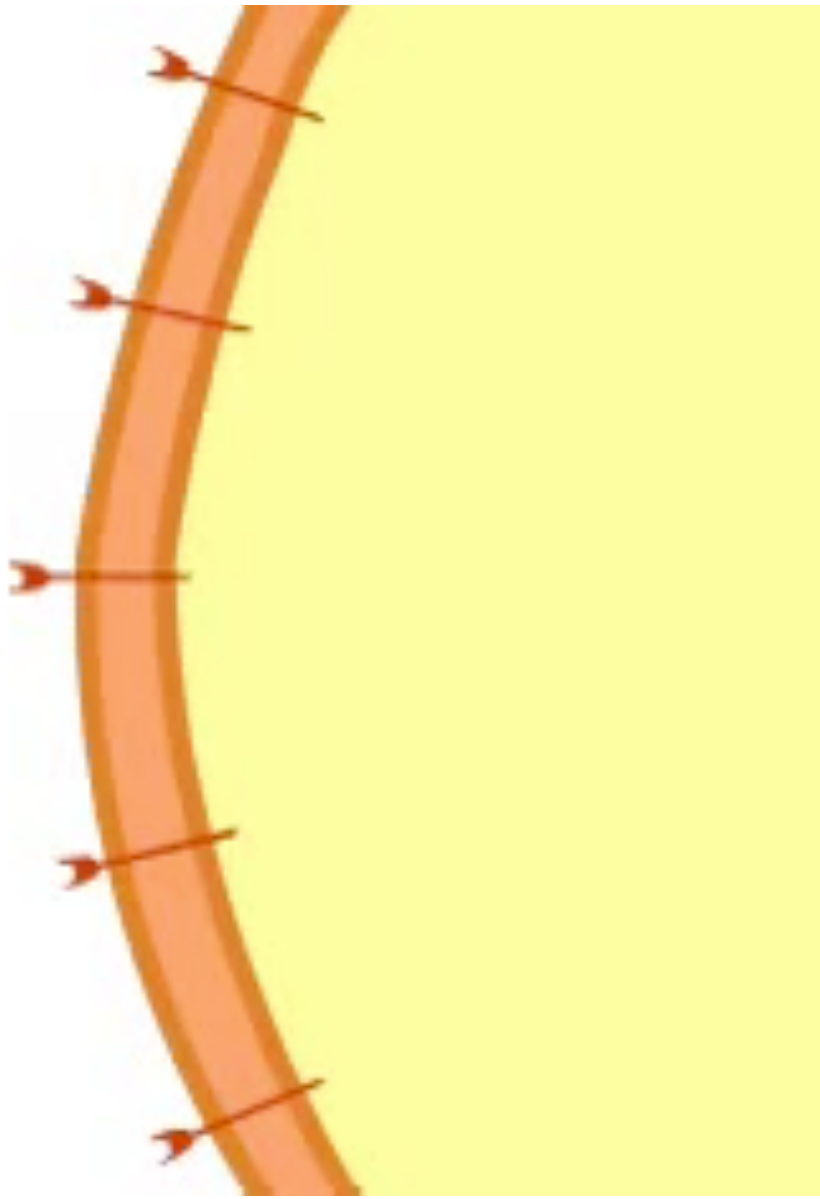
ENDOCYTOSIS

- Process of taking in large molecules into a cell by engulfing them in a membrane



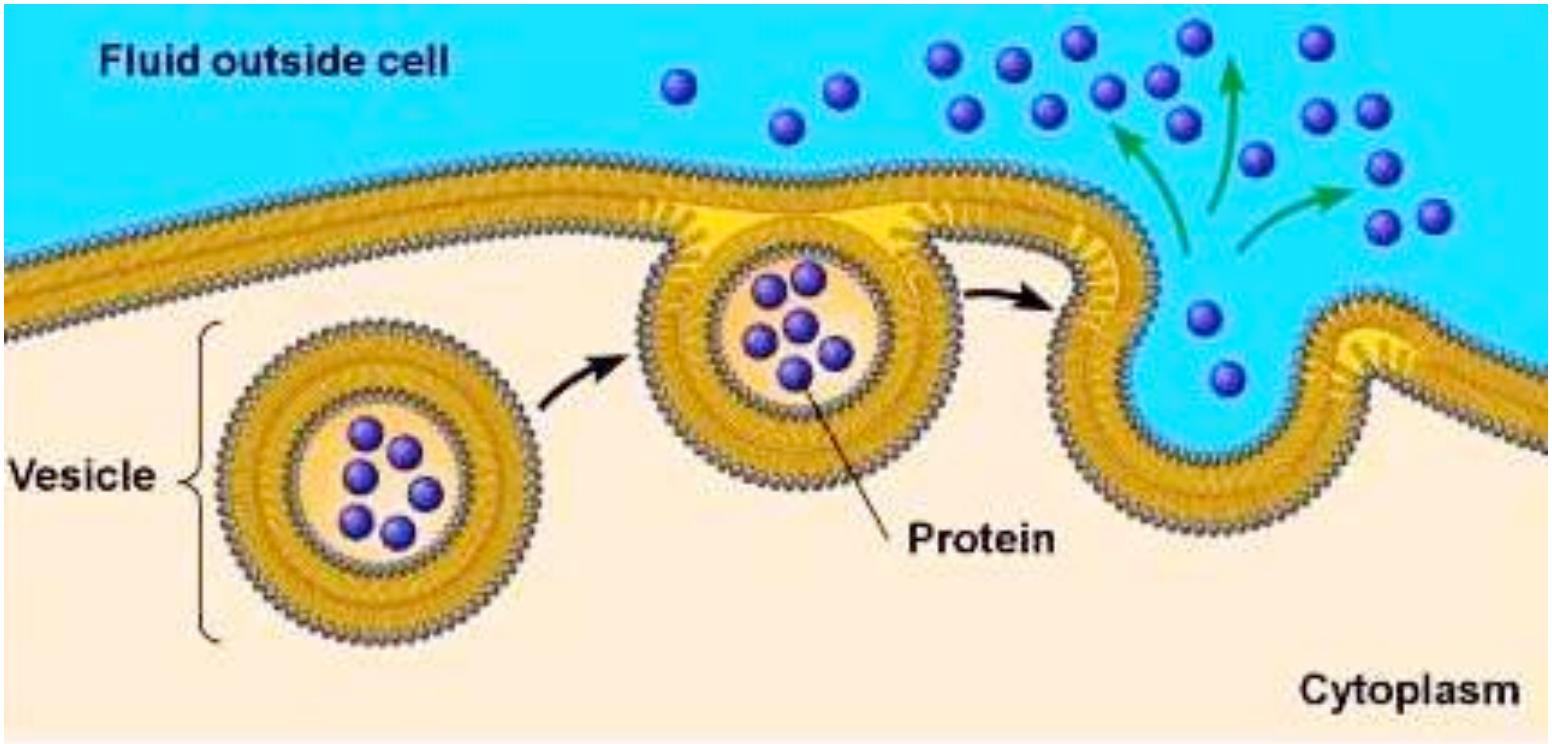
PHAGOCYTOSIS

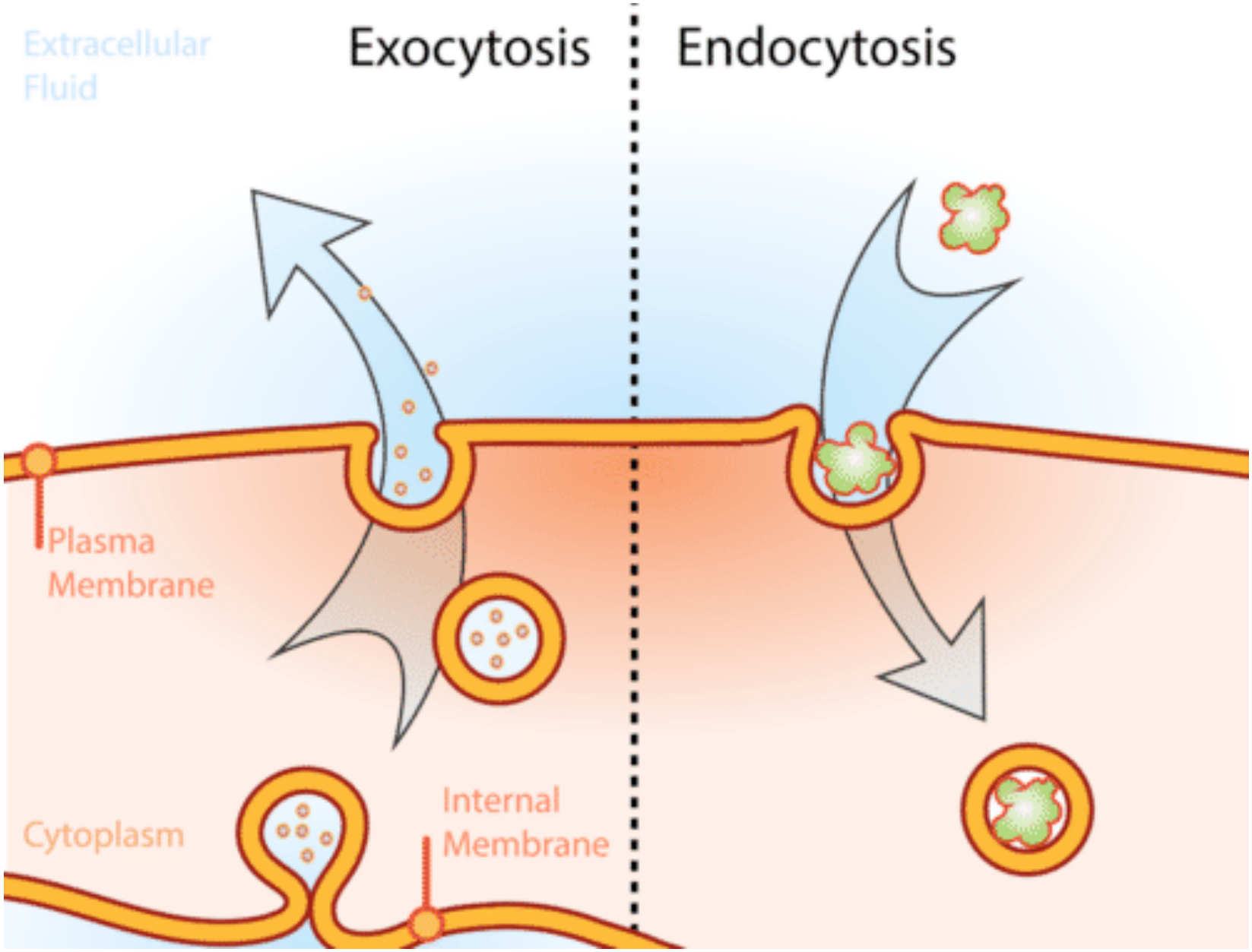
- "cell eating"
- Type of endocytosis
- Molecule fuses with lysosome, which destroys the molecule



EXOCYTOSIS

- Opposite of endocytosis
- Release of substances by the fusion of a vesicle with the membrane




Extracellular Fluid
Exocytosis
Endocytosis
Plasma Membrane
Cytoplasm
Internal Membrane

DEBRIEF

PART C: ACTIVE TRANSPORT

TURN IT IN AS A GROUP

PART C: ACTIVE TRANSPORT

ACTIVE TRANSPORT – ILLUSTRATED SUMMARY

- Create a diagram/picture/flow chart that summarizes ALL of today's notes
- Use at least 4 colors
- Label as necessary

CELL TRANSPORT: DIFFUSION WORKSHEET

HOMEWORK

- WORKSHEET

DO NOW

- Go to kahoot.it
- wait for code

REVIEW

- Work on review sheet

HOMEWORK

- QUIZ ON MONDAY
-