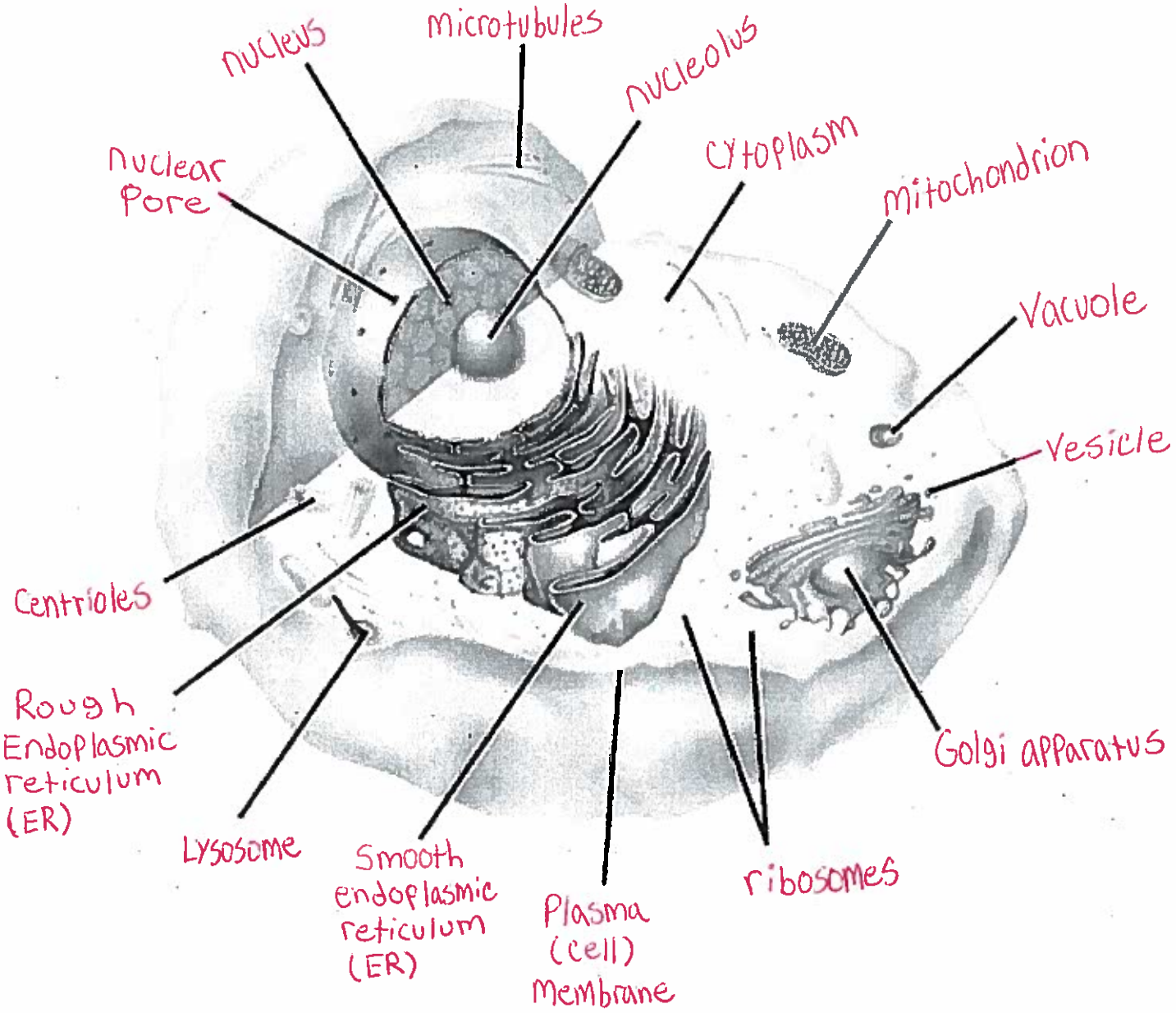
KEY

Notes: Cell Structures/Organelles & Cellular Transport

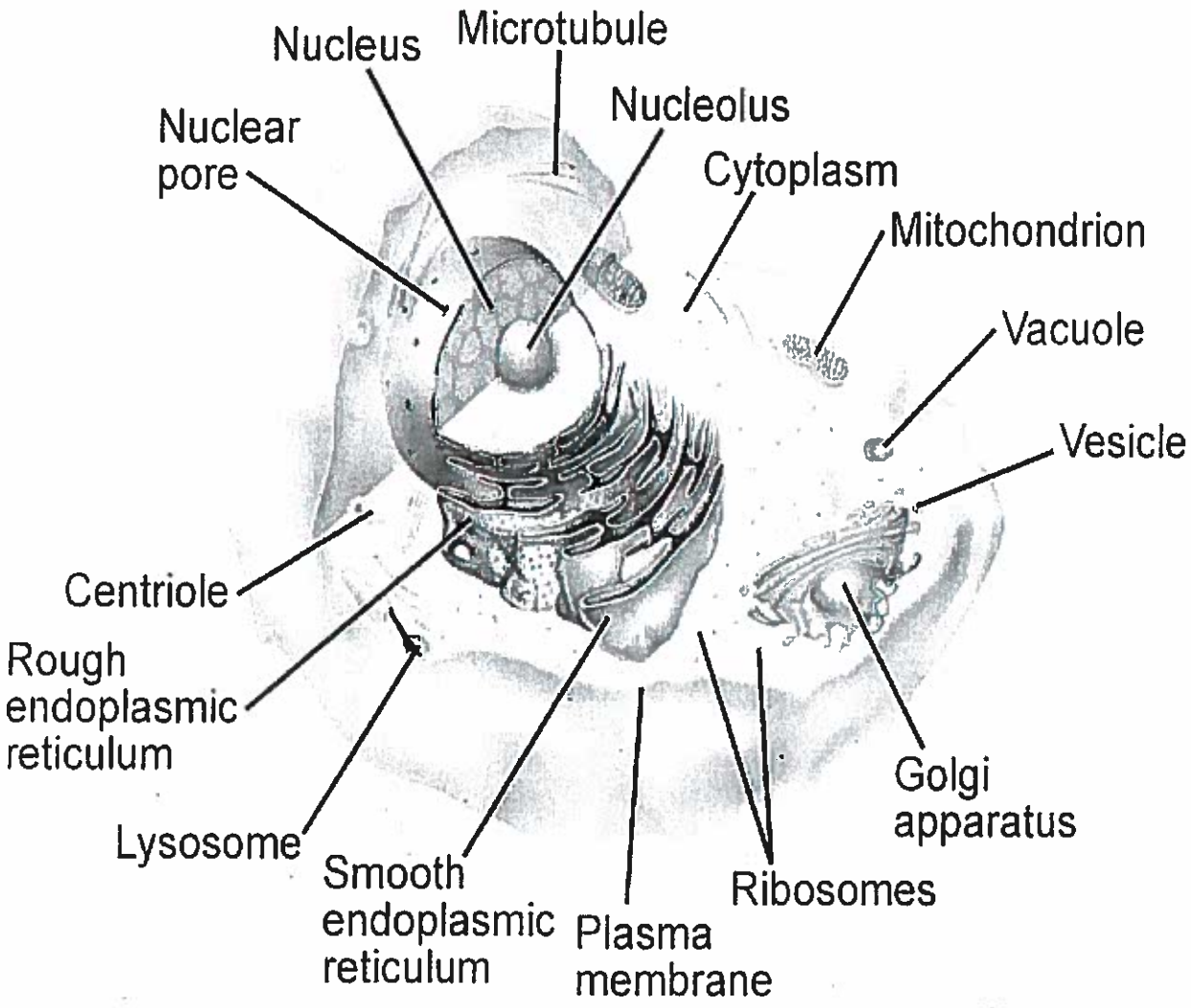
Ch. 7.3 Animal and Plant Cell Structures/Organelles

Plant and animal cells are both examples of eukaryotic **cells.**

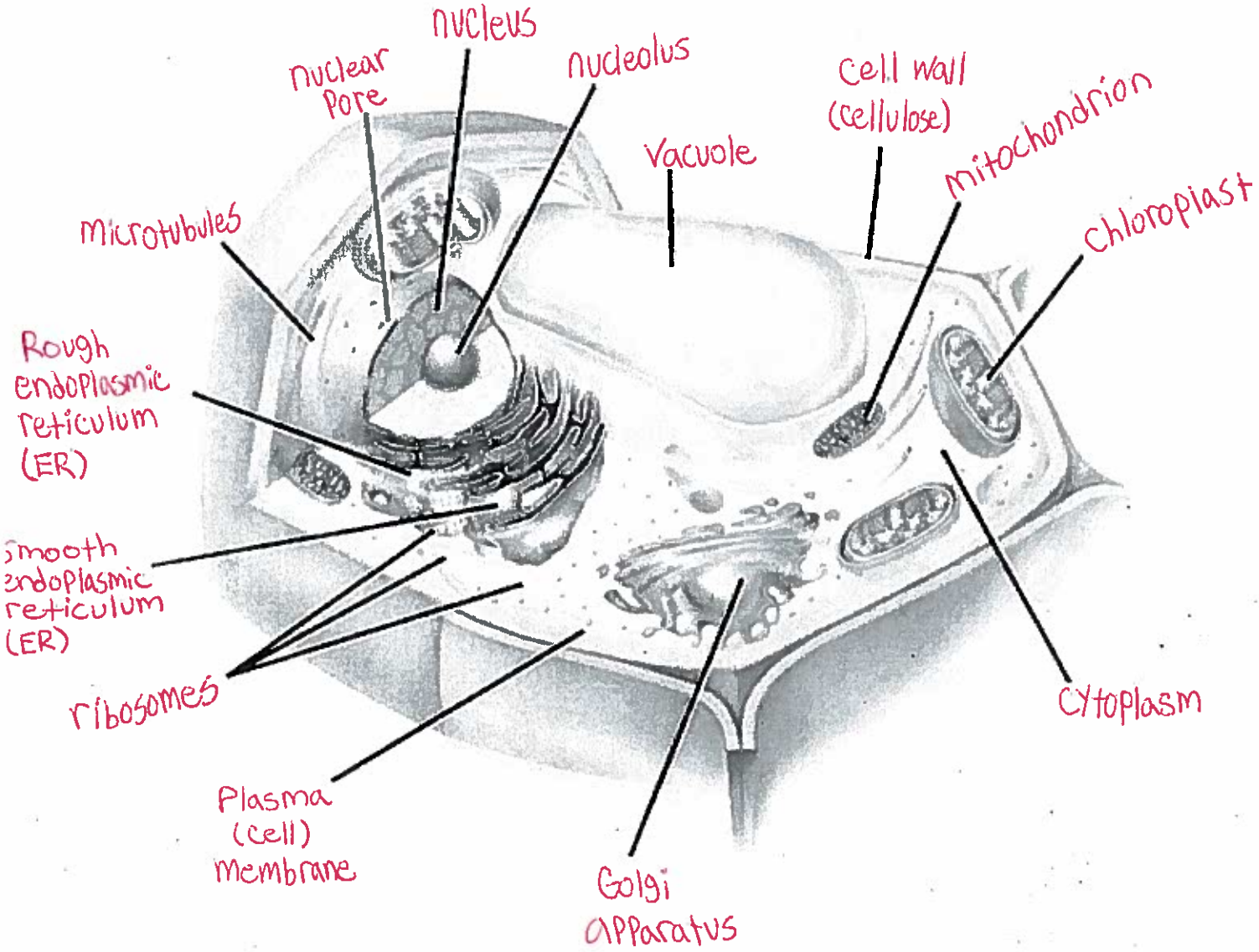
Label the Animal Cell Structures/Organelles



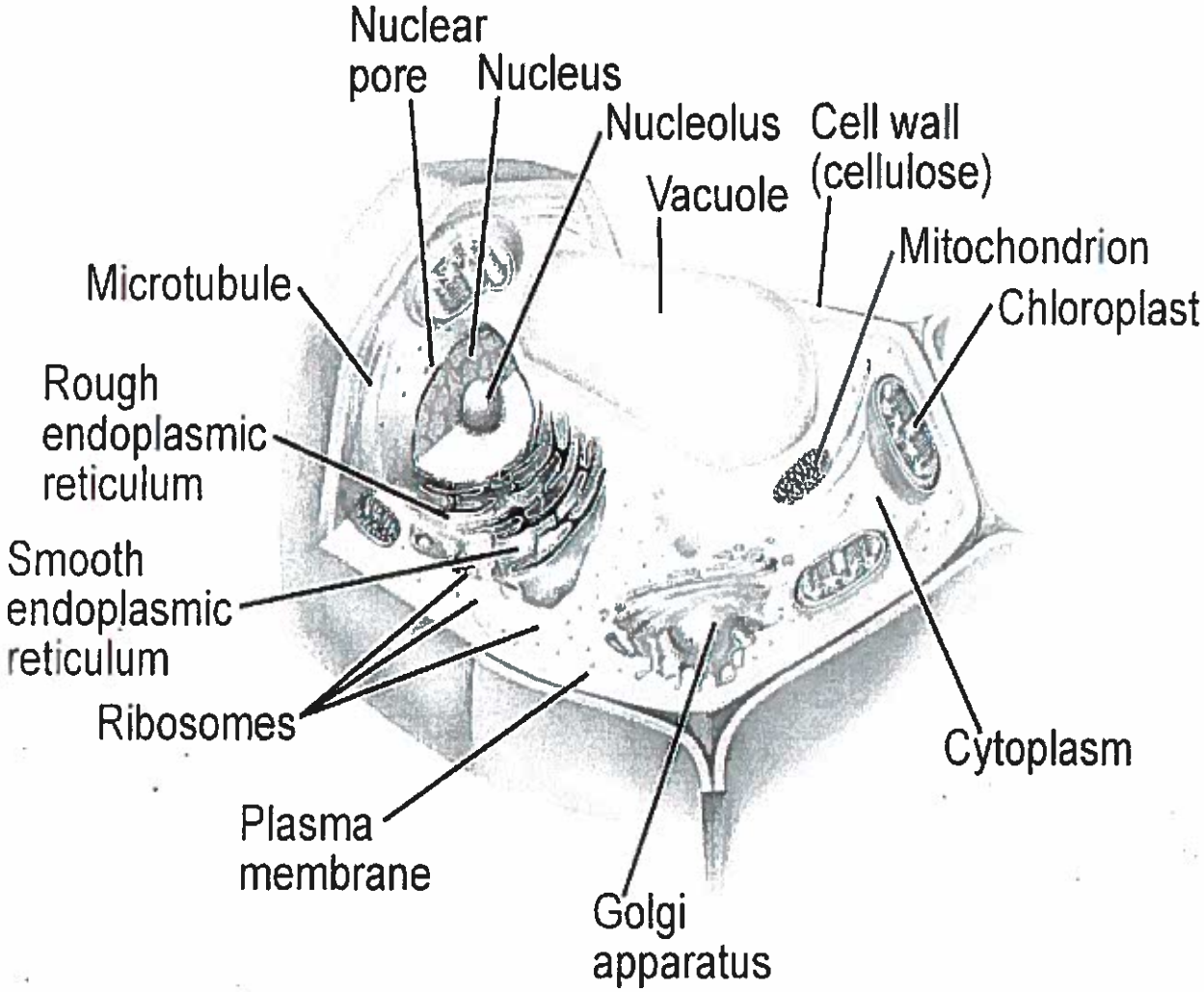
Animal Cell Structures/Organelles Answer Key



Label the Plant Cell Structures/Organelles



Plant Cell Structures/Organelles Answer Key



Compare and contrast between prokaryotic and eukaryotic cells. Identify an example of each type of cell.

Prokaryotic	Both	Eukaryotic
• Simple structure • Smaller cell size • Unicellular • No nucleus • No membrane-bound organelles **Example** Bacteria	• Genetic material (DNA and/or RNA) • Plasma membrane • ribosomes • require energy • maintain homeostasis	• Complex structure • larger cell size • Unicellular or multicellular • Nucleus • Membrane-bound organelles **Example** Animal, Plant, Protist, Fungi

Compare and contrast plant and animal cells.

Plant	Both	Animal
• rectangular cell shape • Cell wall (cellulose) • Chloroplasts • No lysosomes • No centrioles • No cilia • large vacuole	• Genetic material (DNA and/or RNA) • Nucleus • Plasma membrane • mitochondria • ribosomes • eukaryotic • Golgi apparatus	• round cell shape • No cell wall • No chloroplasts • lysosomes • Centrioles • Cilia • Smaller vacuoles (if Present)

Ch. 7.4 Cellular Transport

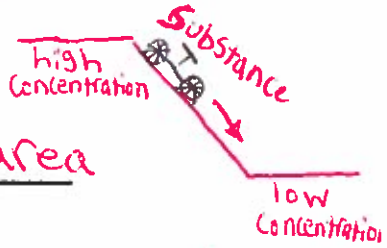
Cellular transport –

Movement of substances across Plasma (cell) membrane.

Two Types of Cellular Transport:

1. Passive Transport - movement of particles across plasma (cell) membrane without using energy. *NO ENERGY

Examples of Passive Transport (no energy required):



a. Diffusion - net movement of particles from an area of higher concentration to an area of lower concentration that does not require energy.

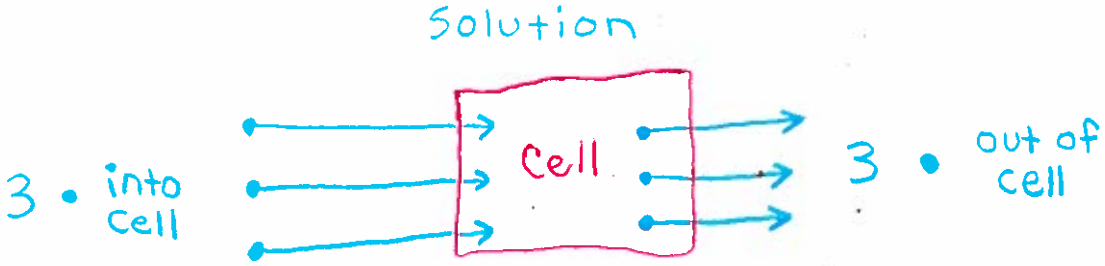
with concentration gradient

Factors that affect the rate of diffusion:

- Temperature
- Pressure
- Concentration

] If ↑ Temperature, Pressure, and/or Concentration, then ↑ rate of diffusion.

When diffusion of substances into the cell = diffusion of substances out of the cell (no net movement of particles), the system is at dynamic equilibrium.



*No net movement of Particles into or out of cell

b. facilitated diffusion - Uses transport Proteins (facilitators) to move ions and other small molecules across the plasma membrane without using energy.

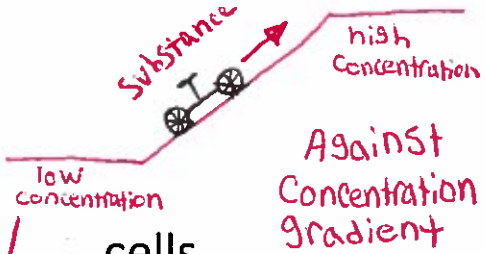
Facilitators (helpers)

- Channel Proteins
- Carrier Proteins

] transport proteins

c. Osmosis - diffusion of water across a plasma (cell) membrane.

2. Active Transport - movement of particles across plasma (cell) membrane using Energy. * ENERGY

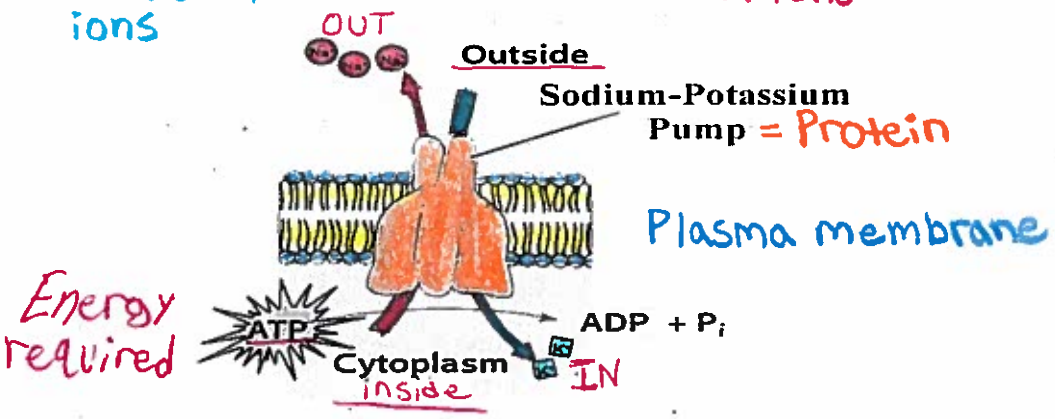


Examples of Active Transport (requires energy):

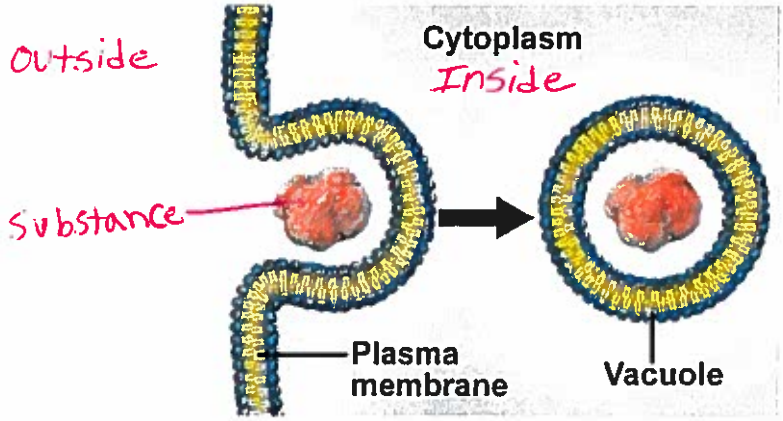
a. Sodium (Na^+)/Potassium (K^+) ATPase Pump

Found in the Plasma (cell) membrane of animal cells.

Exchanges 2 K^+ (Potassium ions) into the cell for 3 Na^+ (Sodium ions) out of cell.



b. *Endo*cytosis - Process by which a cell surrounds a substance in the outside environment, causing its enclosure in part of the plasma membrane.



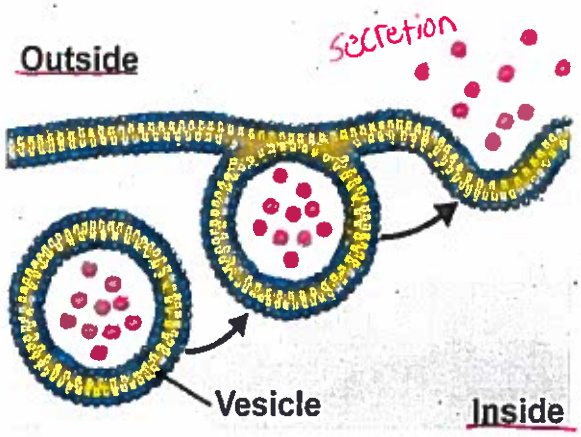
Substance taken into the cell

endo - enter/inside

Ex. White blood cells engulfing bacteria

c. *Exo*cytosis - Process by which a substance is secreted from the inside of the cell to the outside environment.

Ex. Secretion of hormones from endocrine glands



Substance taken out of cell

exo - exit/outside

Compare and contrast passive and active transport? Provide an example of each type of transport in your response.

Passive Transport	Both	Active Transport
• No energy • Moves particles from high → low concentration (with concentration gradient) **Example** 1 Diffusion 2 Facilitated Diffusion 3 Osmosis (diffusion of H_2O)	• Transport substances across plasma membrane • Use proteins • Maintain homeostasis	• Requires energy • Moves particles from low → high concentration (against concentration gradient) **Example** 1 Na^+/K^+ Pump 2 Endocytosis 3 Exocytosis

How do cells react in 3 types of solutions?

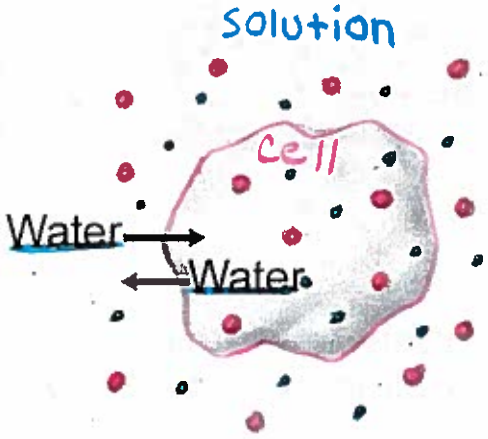
	Hypotonic	Isotonic	Hypertonic
	less solute more water	equal solute equal water	more solute less water
Carb content:	1-3%	6-8%	10%+
Purpose:	Quickly replace the fluids lost by sweating but low in carbohydrates	Quickly replace the fluids lost by sweating and provide a boost of carbohydrates	To supplement carbohydrate intake
Used by:	Those who need hydration without such a hit of carbs: e.g. jockeys, gymnasts	The most commonly drunk by athletes, footballers and other sports people	Those who need very high levels of energy. Best drunk after exercise to top up on muscle glycogen stores
Examples: (% of carbs)			

Graphic created by 5-a-side.com

1. *Iso*tonic Solution *Iso- means* equal or same

* equal [solute] & [H_2O] in solution and cell

- solution in which water and other substances diffuse into and out of the cell at an equal rate (equilibrium, no net movement of water).



Water into Cell = Water out of Cell

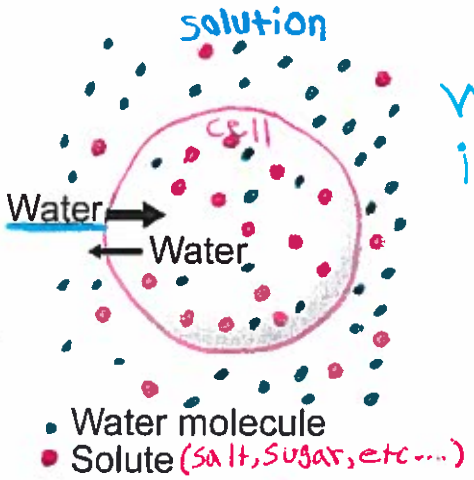
- Water molecule
- Solute (salt, sugar, etc...)

RESULT: The cell size remains the same (no change)

2. *Hypo*tonic Solution *Hypo- means* less than or under

* less [solute] & more [H_2O] in solution than the cell

- solution where there is more water outside the cell than solute, water moves into the cell causing the cell to swell or burst.



Water moves into cell

swells

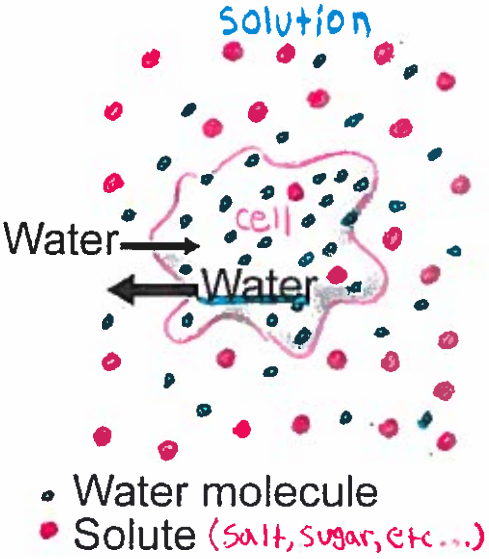
RESULT: The cell size increases / expands / may burst.

* Animal cells may burst in hypotonic solutions because no cell wall

3. *Hyper*tonic Solution *Hyper- means* more than or above

* more [solute] & less [H_2O] in solution than the cell

- solution where there is less water outside the cell than solute, water moves out of the cell causing it to shrink.



Water moves out of cell

RESULT: The cell size decreases / shrinks / shrivels.