

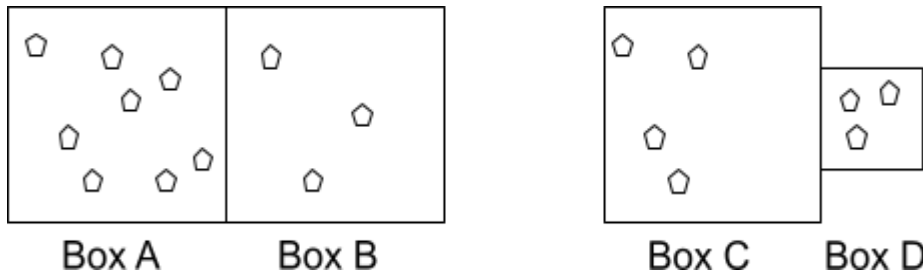
Notes- Membrane Transport

Cell membrane- *semi-permeable* - selectively regulates the flow of materials in and out of the cell to maintain homeostasis

Concentration gradient- The difference in distribution between two areas. Areas with a higher concentration will have more particles in a given space than those with lower concentration.

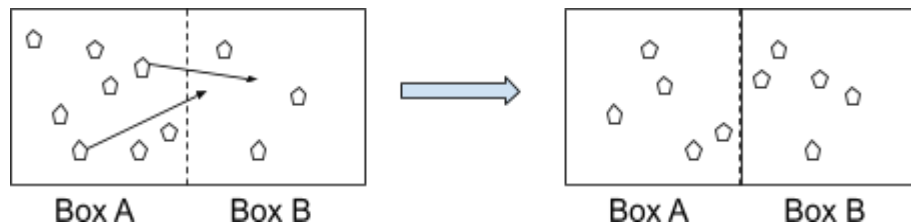
Box A has a higher concentration than Box B (equal size, fewer particles)

Box D has a higher concentration Box C (fewer particles, but smaller space increases concentration)

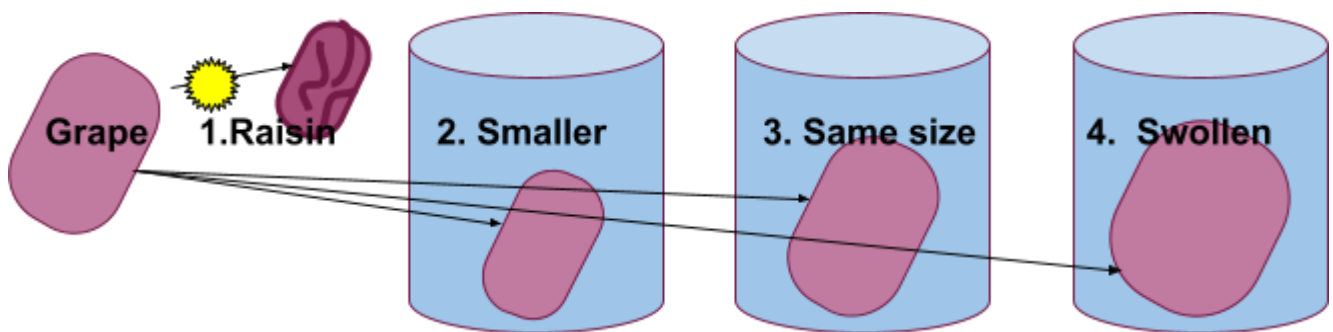


Passive Transport Processes: no energy (ATP) is used to transfer materials as they move *down the concentration gradient*

A. Diffusion - movement from area of high solute concentration to low solute concentration in an effort to establish *equilibrium*



Osmosis- diffusion of **water** through a selectively permeable membrane



1. Raisin- water evaporates out by osmosis

2. Smaller - grape + highly concentrated sugar solution, osmosis moves water out

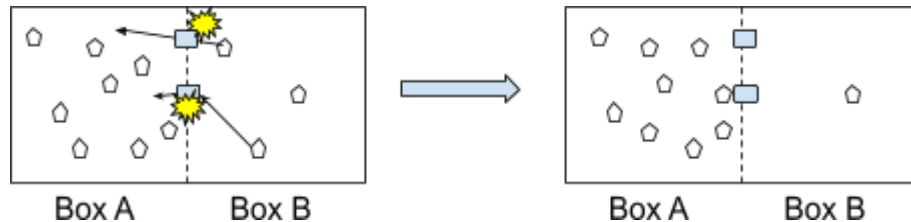
3. Same size - grape + solution at equilibrium - osmosis in/out at equal rates

4. Swollen - grape + water (no sugar) - osmosis moves water in

B. Facilitated Diffusion- materials pass through a protein channel to cross the membrane

Active Transport Processes: energy(ATP) is used to transfer large materials or move materials *up the concentration gradient*

Protein Transport Pumps- trans-membrane proteins that use ATP to pump ions against the concentration gradient



Endocytosis and Exocytosis - move large substances through the membrane



Substances and Transport:

Oxygen and CO_2 (diffusion - passive)

Water (osmosis - passive)

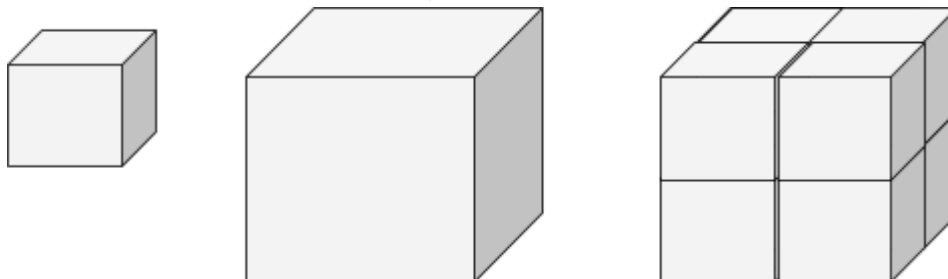
Amino Acids and small sugars (facilitated diffusion - passive)

Ions (protein transport - active)

White Blood Cell "eating" a bacteria (endocytosis - active)

Surface Area to Volume Ratio- as cells get larger, the amount of surface area shrinks in comparison to the volume, making it harder for the cell to maintain homeostasis. As they get too large (or the ratio gets too small) they divide.

ex. 1x1x1 cell has a ratio of 6:1, but a 2x2x2 cell has a ratio of 3:1



There is twice as much surface area in eight blocks than if the same volume is one block