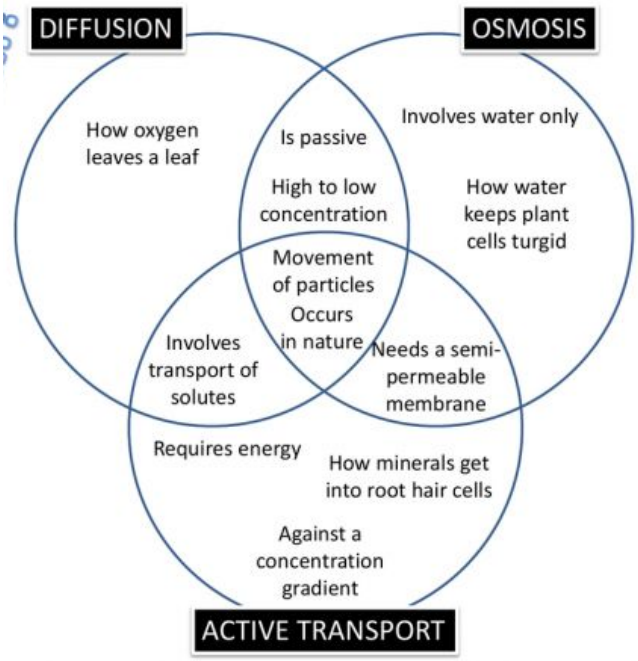
Movement of Particles: 10th Grade- Unit 1, Lesson 5

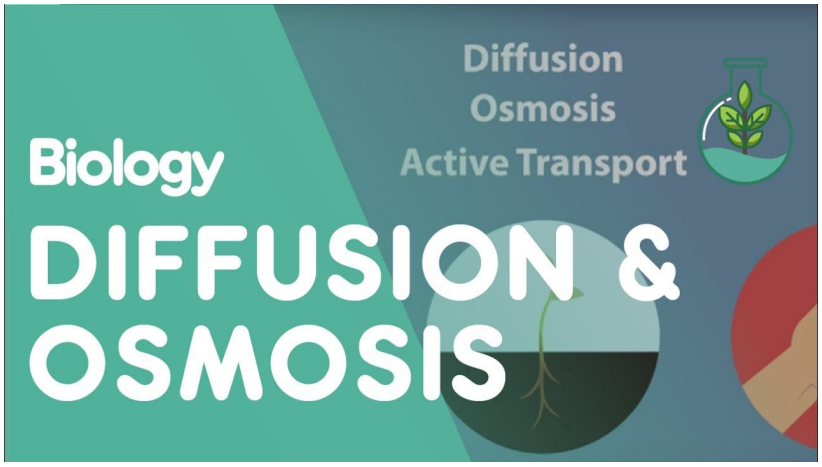
Science concept: Diffusion, Osmosis and Active Transport

In our last lesson we covered the topic of cells. We studied plant and animal cells as well as the cells of microorganisms. I bet there must be one question in particular on your minds. How do substances move into and out of these cells? Well that's the question today's lesson hopes to answer. Substances can move by 3 processes: diffusion, osmosis and active transport. These are cellular transport processes.



Supplementary teaching video link

This short 2-part series explains the processes of diffusion, osmosis and active transport.



https://youtu.be/PRi6uHDKeW4

https://youtu.be/eDeCgTRFCbA

Concept reinforcement questions

1. Diffusion is the process by which particles move from an area of _____ concentration to an area of _____ concentration.

2. Osmosis is the movement of _____ from a _____ solution to a _____ solution.

3. When water moves into animal cells via osmosis, they _____. However, plant cells become _____.

4. In active transport, molecules move from an are of _____concentration to an area of _____.

Answers:

1. *High, low*
2. *Water, dilute, concentrated*
3. *Burst, turgid*
4. *Low, high, concentration gradient*

Additional reading

- There are 3 main factors that affect the rate of diffusion: Temperature, concentration gradient and distance.

- In living organisms, diffusion of dissolved substances such as oxygen, carbon dioxide and glucose occurs into and out of cells across the semi-permeable cell membrane.

- An isotonic solution is one which has the same concentration of solutes as another solution. A hypertonic solution is one which has a higher concentration of solute molecules than another solution. A hypotonic solution is one with a lower concentration of solute molecules than another solution.

Supplementary concept reinforcement exercises

1. Click the link below for access to a worksheet prepared by the Ministry of Education Guyana:

   https://education.gov.gy/web2/index.php/students-resources/secondary-school-resources/grade10/grade10-worksheets/grade-10-worksheets-integrated-science/2588-grade-10-integrated-science-week-3-lesson-2/file

2. Design an experiment to investigate the process of osmosis in plant cells. Use the following materials: potato strips, water, sugar, clear plastic containers.

   You may execute this experiment to observe the results.

3. List three differences and two similarities which exist among the 3 processes(diffusion, active transport, osmosis)

Similarities	Differences

Scratch software

I hope you all learnt alot from today's lesson. For this week's scratch project you will be tasked with creating an animation which clearly illustrates the process of osmosis, diffusion or active transport. If you choose osmosis, be sure to show how osmosis affects either a plant or an animal cell specifically. Most importantly, remember to have fun creating your animations!

This link may be useful when creating your animation!

https://youtu.be/mLzYpXcbv84