What is cell transport?

- An organism must be able to obtain materials for energy, make new materials, and get rid of waste. The exchange of materials take place at the cell membrane because it is semi-permeable. Cells constantly take in oxygen, food and water and expels waste.

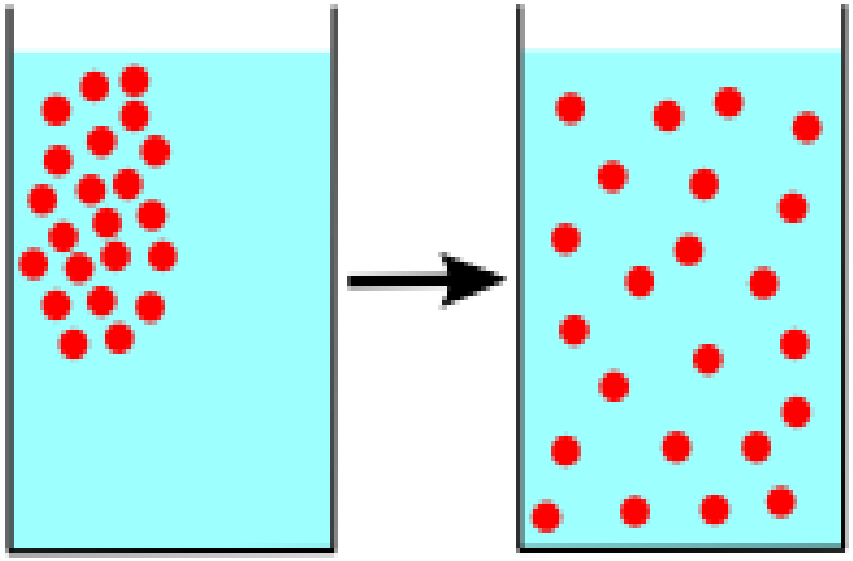
- Organisms must respond to external environment changes in order to maintain homeostasis, the process of correcting imbalance and maintaining a stable internal environment.

Passive Transport

movement of things in and out of the cell ***without*** the use of energy.

- **Diffusion:** movement of materials from an area of high concentration (where there are a lot of molecules) to and area of low concentration (where there are fewer molecules).
- Particles travel from where they are crowded to where they are less crowded.

  Example: Food coloring dropped in the beaker spreads out.



A diagram of diffusion happening. The first diagram shows particles in a liquid. The second shows the same liquid a few seconds later after the particles have spread out.

https://kids.kiddle.co/Diffusion

Cells are surrounded by water.
Diffusion of water through the cell membrane is osmosis. **Osmosis** is a important because it provides the primary way by which water is transported into and out of cells.

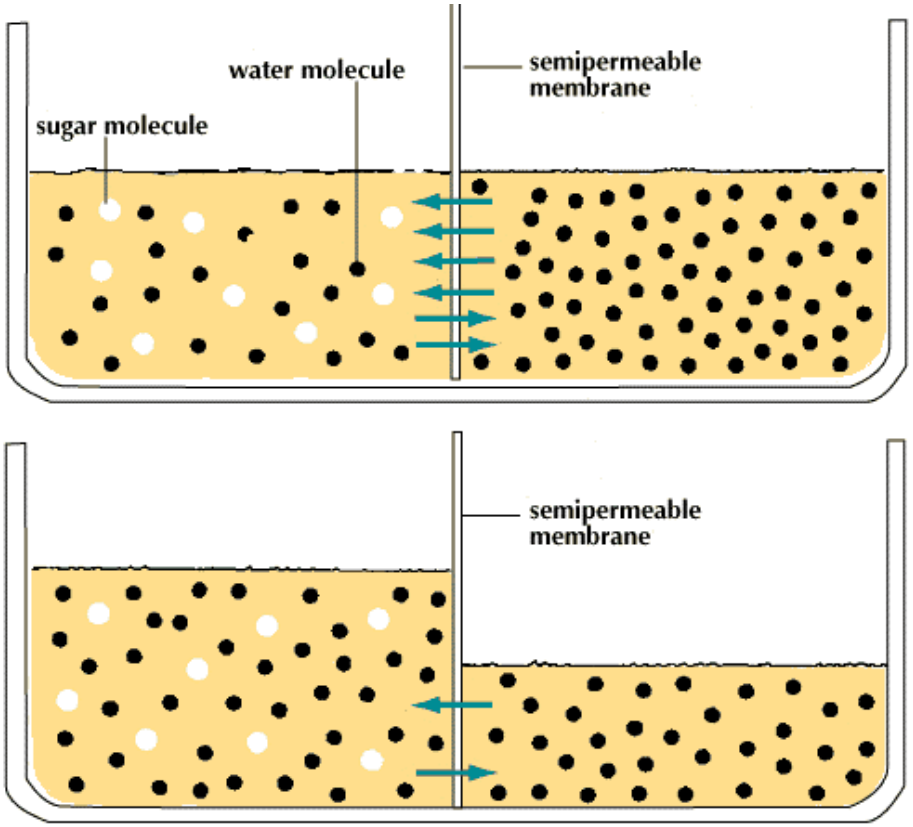
- ***Osmosis:*** is a type of diffusion. The process of water molecules moving from an area of higher concentration to a lower concentration through the membrane.
- Moves from less concentration (less solute) to higher concentrated solution (more solute).
- **Solution**: mixture of 1 or more substances.
- **Solute:** substances dissolved making a solution (sugar, salt).
- **Solvent**: substance that dissolves other substance.

For example if you split a beaker of water into two halves with a semi permeable membrane and added salt to one side, water would move from the side of the beaker with **no** salt until the two concentrations of salt water were the same.

https://www.science-sparks.com/osmosis-made-easy/

Osmosis is the diffusion of a solvent through a semipermeable membrane from a region of low solute concentration to a region of high solute concentration.

http://encyclopedia.kids.net.au/page/os/Osmosis



An example of osmosis occurs when a sugar solution and water, top, are separated by a semipermeable membrane. The solution's large sugar molecules cannot pass through the membrane into the water. Small water molecules move through the membrane until equilibrium is established, bottom.

Type of Osmotic Solutions

- **Isotonic Solution**: concentration inside and outside of the cell are equal.
- **Hypertonic Solution:** it has more solutes (less water) than the cell. Water moves out of the cell to even out the concentration **shrink**.
- **Hypotonic Solution**: fewer solutes (more water) water moves into the cell to equal it out causing to swell, burst.

Active Transport

- Requires energy to move a substance into or out of the cell.
- Molecules move from an area of low concentration to an area of high concentration, therefore energy is required in the form of ATP.
- Small particles cross the cell membrane by diffusion

Endocytosis/Exocytosis

- Large particles move into and out of the cell by active transport:

  Endocytosis: cell surrounds a large particle and encloses the particle in a vesicle (sac) to bring the particle into the cell.

  Exocytosis: large particles, waste leave the cell. A vesicle forms around the particle and carries the particles to the cell membrane and release the particles outside of the cell.