

## Water Movement in Plants

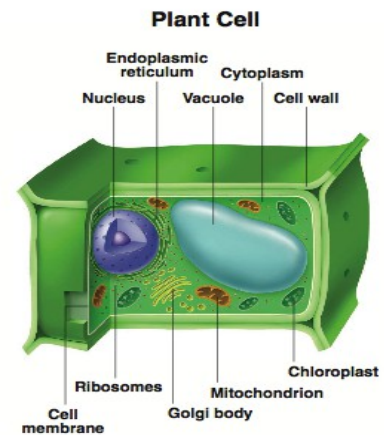
**Diffusion** is the movement of particles from a high concentration (where there are lots of them) to an area of low concentration (where there are few of them). Diffusion occurs in the root cells to obtain nutrients and water.

In plants there is a special kind of diffusion, called **osmosis**. Osmosis occurs when water molecules pass from a dilute solution to a more concentrated solution through a partially permeable membrane.

Example:

Dilute solution → 1 tsp salt + 15 mL water

Concentrated solution → 10 tsp salt + 15 mL water



The root cells have a **cell membrane** that controls what comes in and out of the cells. The cell membrane acts as a gate keeper, only allowing small molecules to move into the cell, making it a partially permeable membrane. (It's only partially permeable because everything can't move through it.)

### How water moves into plant cells by osmosis:

- Water passes into the plant cell by osmosis
  - The cell membrane acts as a partially permeable membrane
  - The vacuole contains cell sap (concentrated solution)
- The concentration of the sap in the vacuole weakens (more water moves into it)
- Water passes from the weak solution into the strong solution of the next cell
- This continues to happen until the cells reach the **xylem** (water transport!)
- The xylem moves the water from the roots out to the leaves

### What happens when water gets into the cells?

Once water is in the cells, they start to swell up. This happens because the water starts pushing against the cell wall (outer layer of plant cells). The cell will continue to grow until it's almost going to burst! A cell is called **turgid** if it prevents the enlarged cells from bursting. When a cell is turgid it provides support to the plant, helping it stay upright.

### What happens when plants lose water?

We already know that plants use water in photosynthesis. Water can also evaporate from the leaves, called **transpiration**. If too much water is lost from the plant cells (meaning they are no longer turgid), the plant will start to **wilt**.