

SUMMARY:

Osmosis to inside the cell:

Plant cell:

- Plant cell will expand or swell. The cell sap has a lower water potential than the solution outside of the cell. By osmosis, there is net movement of water molecules entering the cell into the cell sap in the large central vacuole through the partially permeable cell membrane. As water molecules enter the cell, the large central vacuole increases in size and pushes the cytoplasm against the cell wall. The cell has become turgid.
- Optional points you can write down:
 - Cell does not burst as it is protected by the rigid cell wall
 - Turgidity of cell with water -> turgor
 - Pressure exerted by water in vacuole -> turgor pressure

Animal cell:

- The animal cell will expand or swell, and the cell membrane will eventually burst. The cytoplasm of the cell has a lower water potential compared to the solution outside the cell. By osmosis, there is net movement of water molecules entering the cytoplasm through the partially permeable cell membrane. As water molecules enter the cell through the partially permeable cell membrane, the cytoplasm increases in size and pushes against the cell membrane. However, unlike the plant cell, the animal cell does not have a cell wall to protect it from injuries, which causes the cell membrane to burst.

Osmosis to outside the cell:

Plant cell:

- Decreases in size and becomes flaccid/limp. The cell sap of the plant cell has a higher water potential compared to the surrounding solution outside the cell. By osmosis, there is net movement of water molecules moving from the large central vacuole (cell sap) to outside the cell through the partially permeable cell membrane. As the cell loses water, the vacuole decreases in size. The cytoplasm shrinks away from the cell wall. The shrinkage of cytoplasm and cell membrane away from the cell wall is known as plasmolysis. The cell is said to be plasmolysed.

Animal cell:

- The cell shrinks and spikes appear on the cell. The cytoplasm of the animal cell has a higher water potential than the solution outside of the cell. By osmosis, there is net movement of water molecules moving from the cytoplasm of the animal cell to the solution outside the cell through the partially permeable cell membrane. The cytoplasm shrinks away from the cell membrane. The process is called crenation. Animal cell becomes dehydrated and will eventually die.