

## Movement In and Out of Cells

(IGCSE Biology Syllabus 2016-2018)

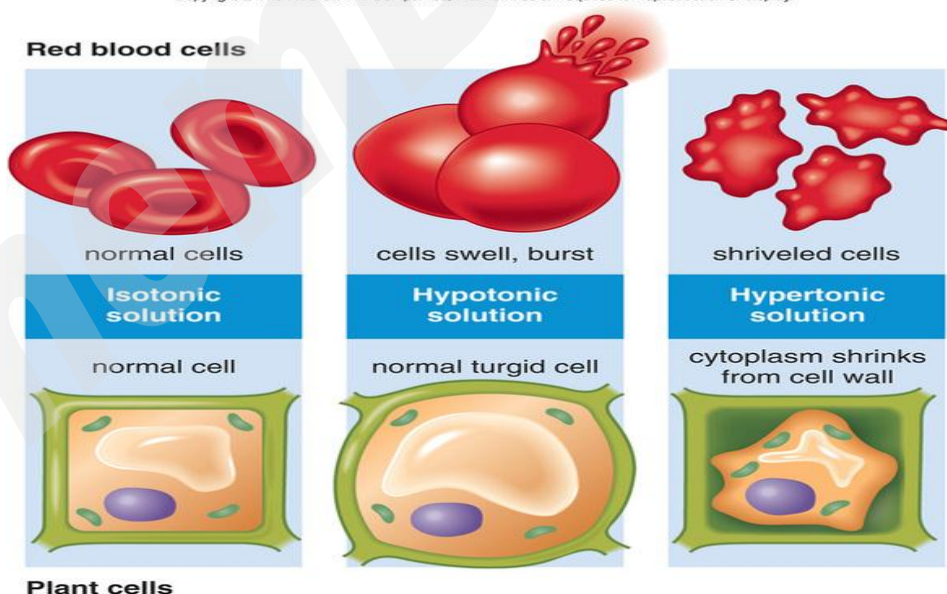
### Diffusion

- Movement of molecules from a region of high concentration to a region of low concentration down the concentration gradient
- This results in random movement of molecules until equilibrium is reached
- Factors influencing faster diffusion:
  - Larger concentration gradient
  - Higher temperature
  - Smaller surface area

### Osmosis

- Movement of water molecules from a region of high water potential to a region of low water potential through a partially permeable membrane
- Isotonic: concentration of solute = concentration inside cell → no change in size
- Hypertonic: concentration of solute outside cell > concentration inside cell: plant cell → cytoplasm shrinks from cell wall; animal cell → cell shrinks
- Hypotonic: concentration of solute outside cell < concentration inside cell: plant cell → turgid; animal cell → cell swell and burst

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### Active Transport

- Movement of particles through a cell membrane via a protein transporter, from a region of lower concentration to a region of higher concentration against a concentration gradient, using energy released during respiration
- Active transport is needed when an organism wants to optimize the amount of nutrients it can take up – ion uptake by root hairs and uptake of glucose by epithelial cells of villi

