2 Moving substances across the membrane – Part 2

Name: _____ Class: _____ Date: _____

Vocabulary

Write each word three times.

English	**Write it 3 times** (English)		
Diffusion			
Osmosis			
tonicity			
Active transport			
endocytosis			
exocytosis			

Recall

In Part A you met the selectively permeable cell membrane. Now see how things cross it:

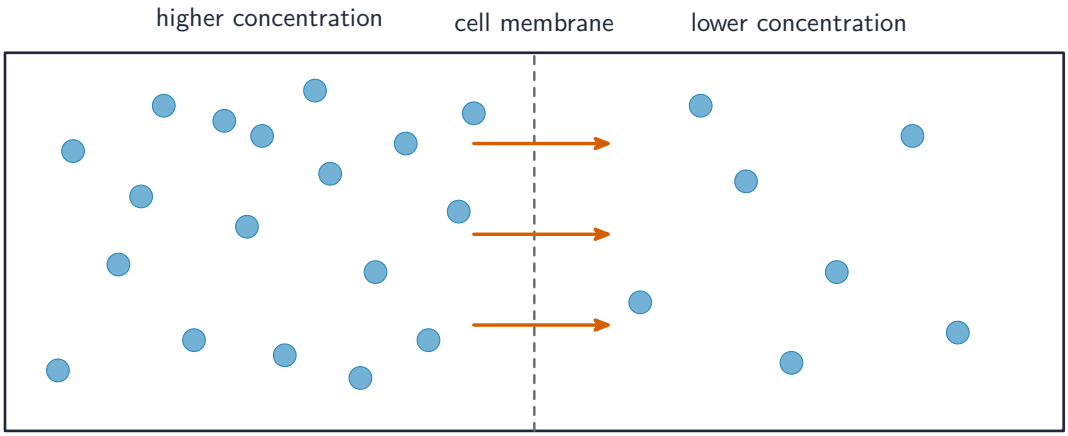
- You have watched a drop of dye spread through water (diffusion).
- You know water moves in and out of cells (osmosis).
- Some things need energy to move; others move on their own.

Each idea has a short worked example before the Practice.

New ideas

1 Diffusion

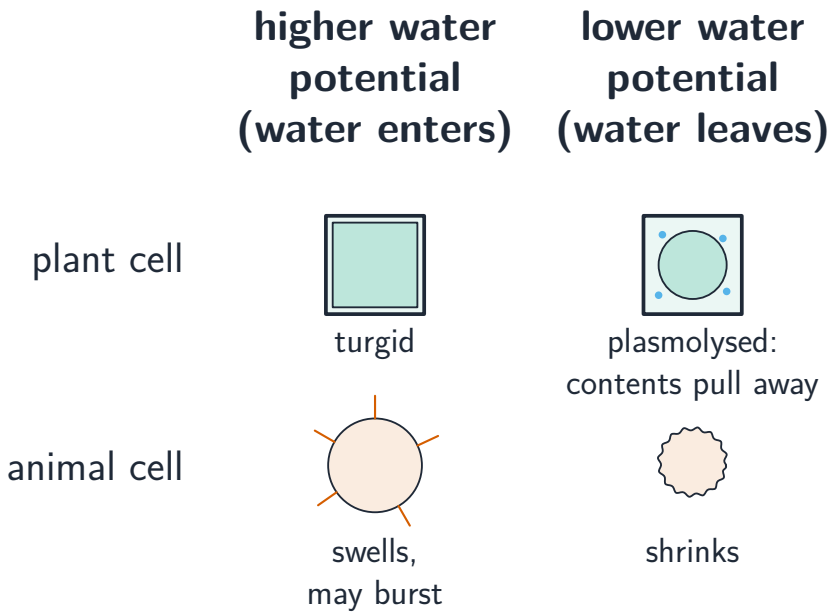
Diffusion is the spreading of particles from where they are **crowded** (high concentration) to where they are **spread out** (low concentration). It needs **no energy**.



net movement of particles down the concentration gradient

2 Osmosis and tonicity

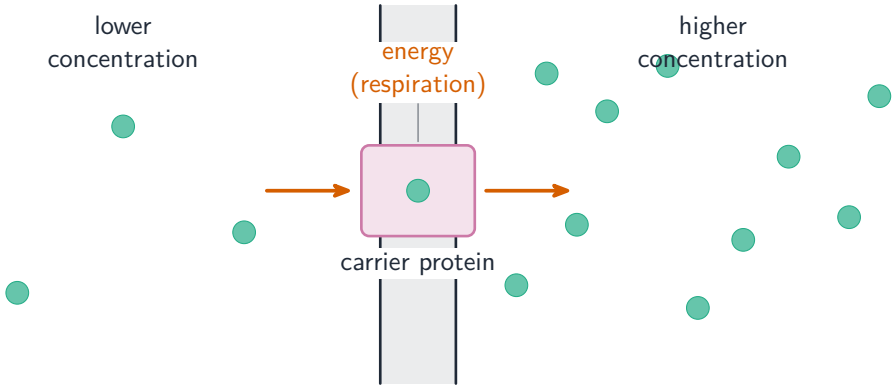
Osmosis is the diffusion of **water** across a membrane. Comparing the solution's strength (**tonicity**): in a weaker (hypotonic) solution a cell gains water; in a stronger (hypertonic) one it loses water.



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3 Active transport

Active transport moves particles the "wrong" way – from low to high concentration – so it needs **energy** (ATP) and a carrier protein.



particles moved against the gradient, using energy

4 Moving big things

Very large items cross in bulk: **endocytosis** brings material **in** (the membrane wraps around it), and **exocytosis** sends material **out**.

Watch out: diffusion and osmosis need **no** energy (particles move down their gradient on their own); active transport needs energy because it pushes particles **against** the gradient.

Practice

Try these in order. The methods are all above.

2.1 State the direction (high to low, or low to high) that particles move during diffusion. [1]

2.2 Explain what osmosis is. [2]

2.3 A cell is placed in a very strong (hypertonic) sugar solution. State what happens to it and why. [2]

2.4 State the two things active transport needs that diffusion does not. [2]

2.5 Name the process that a cell uses to take in a large particle from outside. [1]