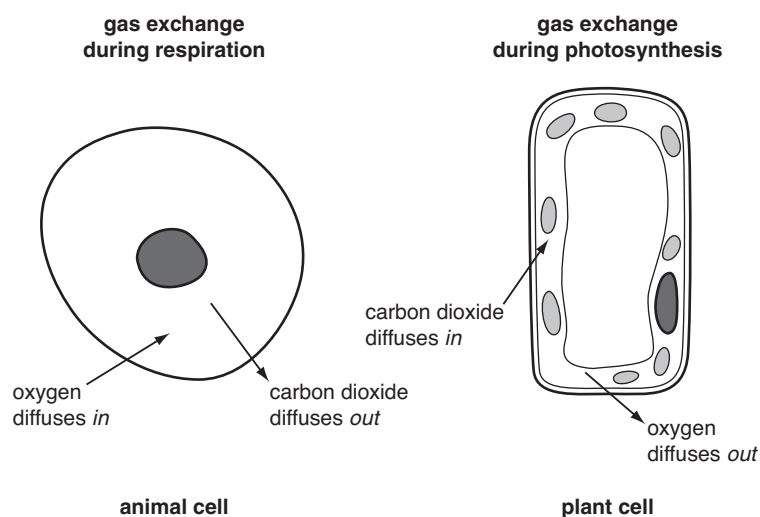


The movement of substances into and out of cells

Diffusion

Diffusion is the movement of substances from high to low concentration. In GCSE questions diffusion is usually linked to **gas exchange** in photosynthesis and/or respiration as shown in Figure 2.1.

Figure 2.1
Gas exchange and diffusion

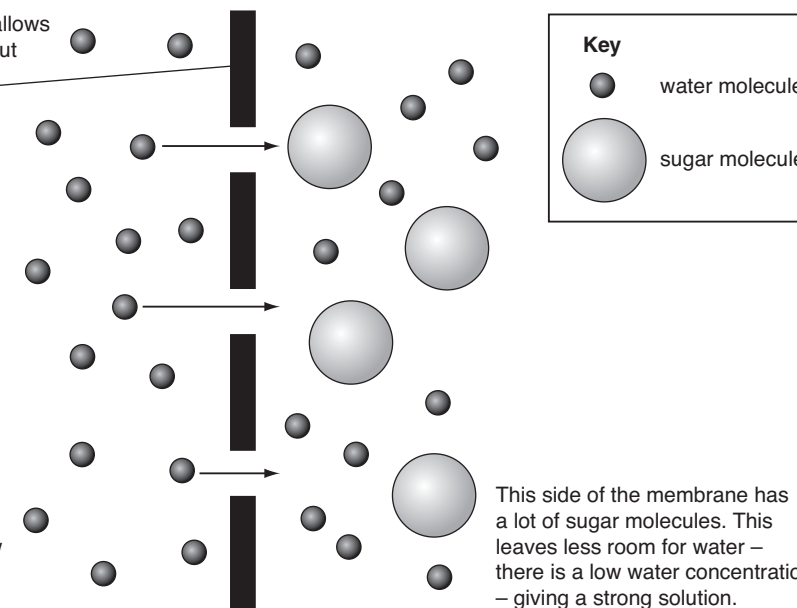


Osmosis

Osmosis is a very special case of diffusion that involves the movement of **water**. It is the movement of water from where it is in **high concentration** to where it is in **low concentration** (note: this can be described as moving down the concentration gradient) across a **partially permeable membrane** as shown in Figure 2.2.

Figure 2.2 The process of osmosis

partially permeable membrane – allows small molecules through (water) but not larger molecules (sugar)



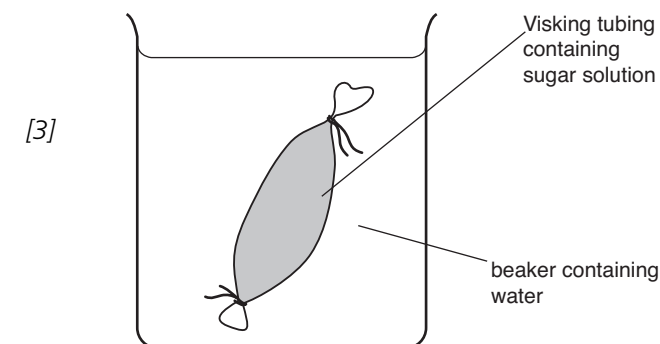
On this side of the membrane there are many water molecules. There is a high water concentration but a low concentration of solute (sugar) – giving a weak solution.

This side of the membrane has a lot of sugar molecules. This leaves less room for water – there is a low water concentration – giving a strong solution.

Note: In Figure 2.2 the water moves from left to right by osmosis. Exam questions often give examples of osmosis and ask you to explain what is happening. The following two questions show two ways in which osmosis is examined.

Questions

- 1 The apparatus shown was set up in a classroom to demonstrate the process of osmosis. Describe and explain what happens after 24 hours.



Typical answer

- 1 The following three points for 3 marks.

- There are more water molecules outside than inside the tubing. [1]
- Water would move into the tubing and the tubing would expand. [1]
- The Visking tubing is partially permeable. [1]

Note: You had to work out that the sugar solution inside the Visking tubing would contain fewer water molecules than the water outside. Figure 2.2, above, shows why this is so.

You would not get a mark for using the word 'osmosis' in your answer because it was mentioned in the question.