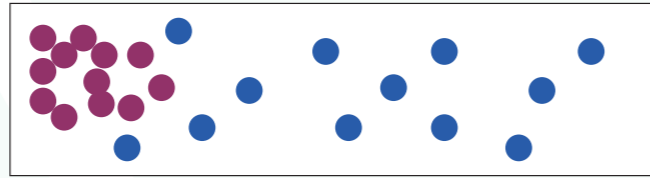
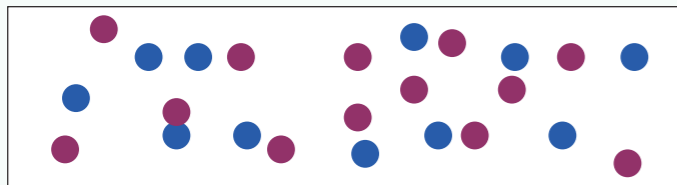


## Diffusion

Constantly moving liquid and gas molecules tend to move from an area of **high concentration to an area of lower concentration**:



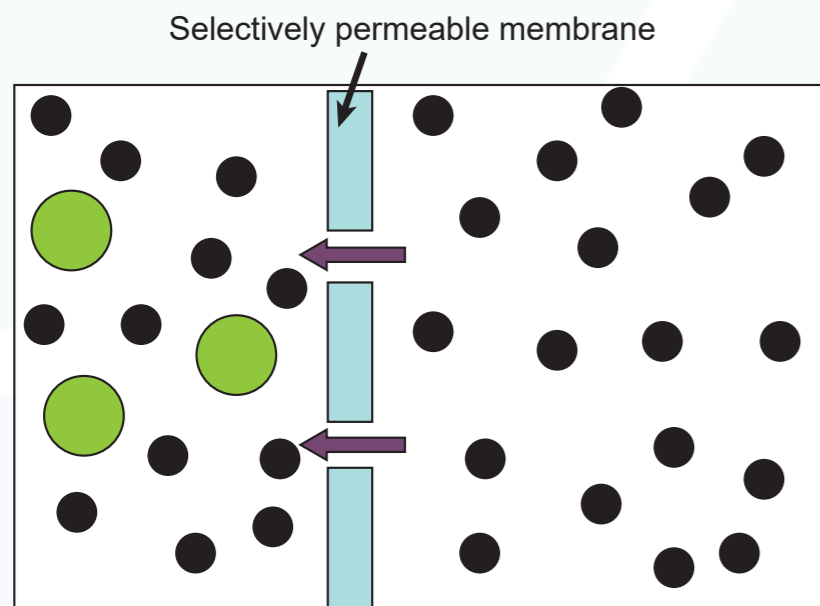
until evenly distributed :



- This is a **passive** process – it does not require energy.
- Molecules move **down a concentration gradient**.
- This process is called **diffusion**.

### Factors that affect diffusion include:

Concentration	The greater the concentration gradient the greater the diffusion rate.
Temperature	At higher temperatures molecules have more kinetic energy and so move and diffuse faster.
Pressure	Molecules move quickly from an area of higher to lower pressure.

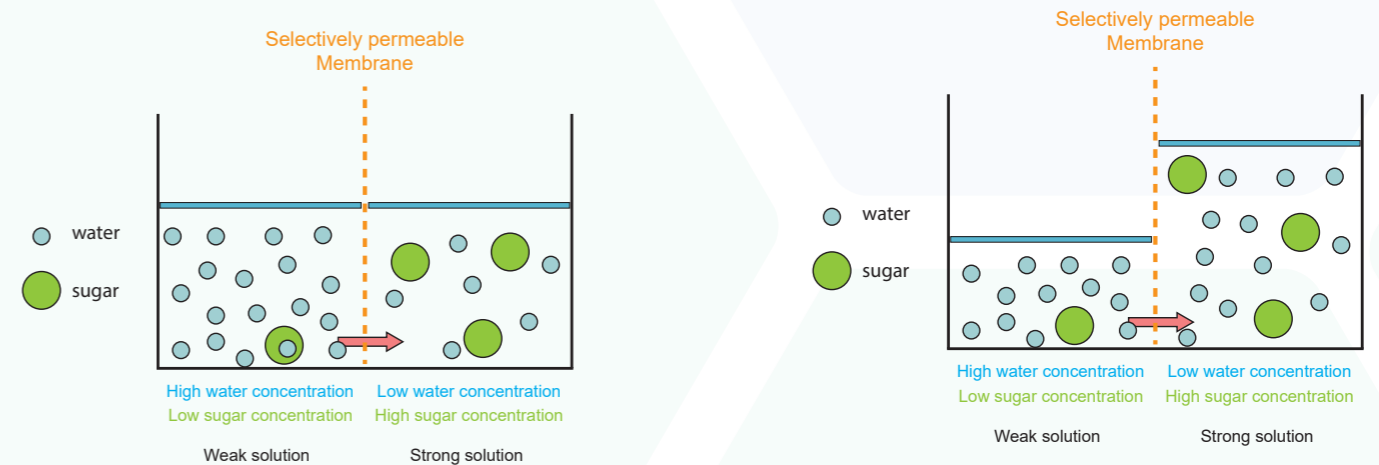


Visking tubing can be used to model a cell membrane as it is selectively permeable.

Only molecules small enough can diffuse through the pores.

## Osmosis

Osmosis is the diffusion of water from **high water concentration** (dilute solute solution) to **low water concentration** (concentrated solute solution) across a **selectively permeable membrane**.



When answering exam questions on osmosis consider the data given and describe using the following statements:

Do	Do not
Do state in which direction the water is moving in the example.	Do NOT talk about the solution moving. Large solute molecules do not cross the membrane, only water does.
Do state that water moves from a high to low water concentration.	Do not suggest salt or sugar can cross cell membranes, they cannot.
Do state that water is moving by osmosis and that the net movement is in the direction stated.	Do not suggest molecules only move in one direction, they will cross the membrane in both directions but the NET movement will be in one direction if osmosis is occurring.
Do state that water moves across a semi-permeable membrane.	Do not call the membrane permeable, if it were osmosis would not occur.
Then give the result e.g. animal cells burst if too much water goes in but plant cells become turgid, they are held together by the cell wall. Plants will wilt if their cells become flaccid (lose too much water) and animal cells will shrink.	Do not describe animal cells as turgid and flaccid, these terms apply to plant cells.

## Active Transport- Higher tier only

Active transport moves molecules **against a concentration gradient**.

This process **uses energy in the form of ATP** provided by **respiration**. **Glucose and oxygen** are required for respiration.