#### Introduction

Cells need different substance to move in & out of them through their cell membrane. Substances can move into and out of cells through the cell membrane. The three main types of movement are diffusion, osmosis and active transport.







<mark>.</mark>

S

0

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

#### **Specification Link:**

Plant & Animal Pathogens: 4.1.1

Diffusion

Diffusion is the random movement of a substance from a region of high concentration to a region of low concentration

Particles (molecules and ions) in a liquid and a gas move continuously. Because of this movement, particles will spread themselves evenly throughout a liquid or a gas.

Particles will move in both directions, but there will be a net movement from high to low concentration

Particles will end up evenly spread throughout the liquid or gas, but will continue to move



**Specification Link:** 

Plant & Animal Pathogens: 4.1.1



Active transport is the movement of dissolved molecules into or out of a cell through the cell membrane, from a region of lower concentration to a region of higher concentration.

The concentration is higher inside the cell than outside

Molecules are taken in against the concentration gradient

A carrier protein is used to transport molecules across the cell membrane

**Energy is required to make the carrier protein work.** This energy comes from respiration

**5** The molecules are then released into the cell

Active transport

1

3

4

This increases the concentration inside the cell

#### **Specification Link:**

Plant & Animal Pathogens: 4.1.1

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

Osmosis

When the concentration of water is the same on both sides of the membrane, the movement of water molecules will be the same in both directions. There will be no net movement of water molecules. In theory, the level of solution two will rise, but this will be opposed by gravity and will be dependent on the width of the container.

