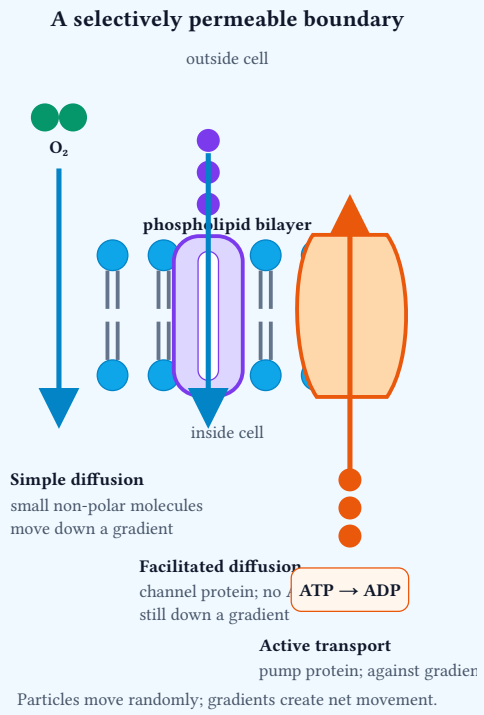
Science 10

Unit C: Cycling of matter in living systems

Membrane transport

Food colouring in water

- Dye particles move randomly and spread from higher concentration to lower concentration.
- Net spreading continues until concentration is more uniform, even though particles still move.



Random motion and net movement

- Individual motion is random; the concentration difference produces net movement statistically.
- Random motion continues, but there is no net movement in one direction.
- Name the particle or the water, the direction of the gradient, what the membrane does, and whether the cell spends energy.

Key terms

diffusion

Net movement of particles from higher concentration to lower concentration.

osmosis

Net movement of water across a selectively permeable membrane.

active transport

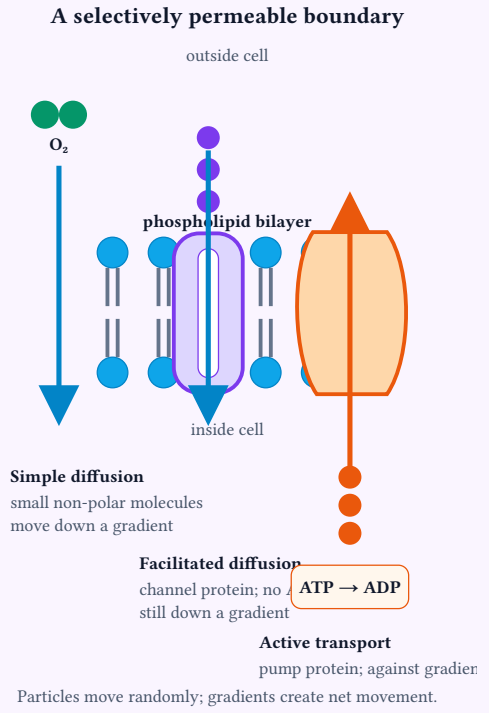
Membrane transport against a concentration gradient using cellular energy.

concentration gradient

A difference in concentration across distance or a membrane.

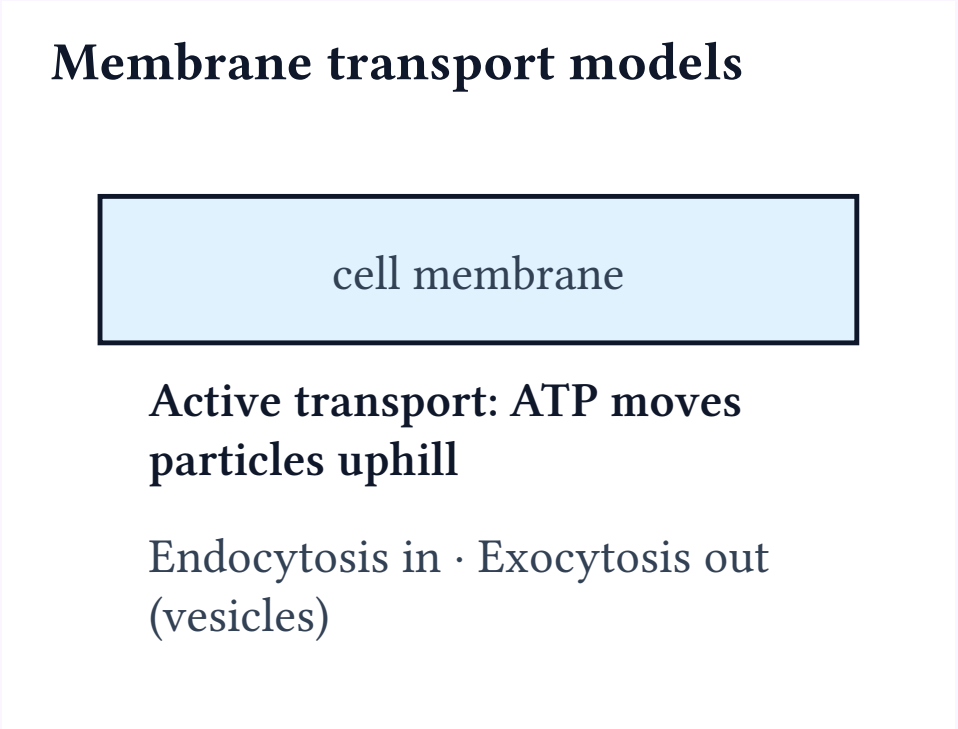
Passive transport

- Particles spread from where they are crowded toward where they are scarce.
- Osmosis is that kind of spread for water, across a membrane that blocks some solutes.
- At equilibrium the particles still move. The two directions match, so concentrations stop changing.
- Predict the net direction from the concentration difference and from what the membrane allows.



Models

- Active transport spends cellular energy to move particles toward the higher concentration.
- Endocytosis wraps cargo in a vesicle. Exocytosis merges a vesicle with the membrane to release cargo.
- Carrier proteins move smaller loads than a vesicle does.
- Direction, cargo size, and energy use are the three comparisons.



Transport sort

- Classify membrane scenarios as diffusion, osmosis, or active transport and justify the energy requirement.
- A complete answer names the particle or the water, the direction of the gradient, the membrane's role, and whether the cell must supply energy.