

Exercise walk-through

Diffusion ■ 3.1

eXercise

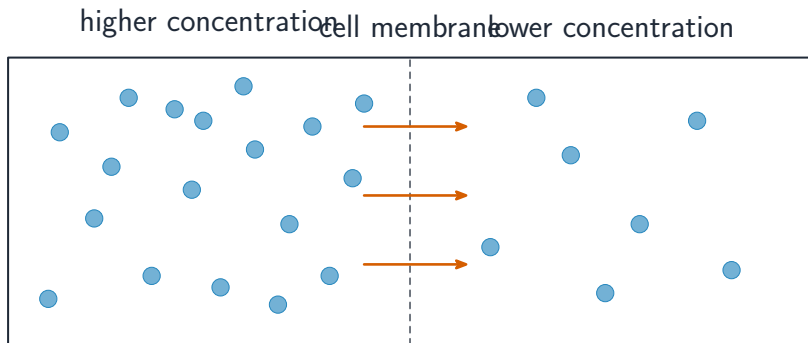
You must be able to

- define diffusion (net movement down a concentration gradient)
- state where the energy comes from
- give the factors that affect the rate of diffusion

Method — Diffusion

- **no extra energy** — uses the particles' own random (kinetic) movement.
- **faster when:** larger surface area, higher temperature, steeper gradient, shorter distance.
- e.g. O₂ diffuses into cells, CO₂ diffuses out.

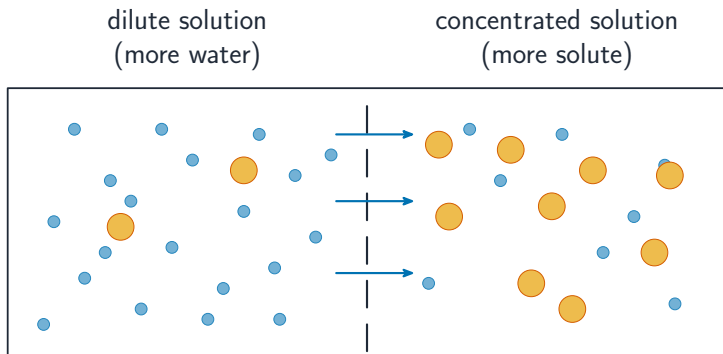
Method — Diffusion



net movement of particles down the concentration gradient

Particles spreading from crowded to less-crowded across a membrane

Method — Diffusion



water moves by osmosis to the concentrated side; solute is too big to cross

Osmosis is the diffusion of water across a membrane

Practice 2.1 ■ 2 marks

Define diffusion.

Solution 2.1

Worked steps

the net movement of particles from a region of higher concentration to a region of lower concentration **M1**, down a concentration gradient **A1**.

Practice 2.2 ■ 1 mark

State where the energy for diffusion comes from.

Solution 2.2

Method: Diffusion

Worked steps

the kinetic energy of the random movement of the particles **B1**.

Exam-style 3.1 ■ 1 mark

Diffusion is faster when the temperature is:

- A** lower
- B** higher
- C** at freezing point
- D** it has no effect

Solution 3.1

Method: Diffusion

A lower

B higher



C at freezing point

D it has no effect

Worked steps

B. Higher temperature makes particles move faster, so diffusion is faster.

Exam-style 3.2 ■ 1 mark

Oxygen moves from the air in the alveoli into the blood.

- (a) Name the process.
- (b) State two factors that would increase the rate of this movement.

Solution 3.2

Worked steps

(a) diffusion **B1**.

(b) any two of: larger surface area; higher temperature; steeper concentration gradient; shorter distance **B1** **B1**.

Exam-style 3.3 ■ 2 marks

Explain why diffusion does not require energy from respiration.

Solution 3.3

Method: Diffusion

Worked steps

the particles move using their own random (kinetic) energy **M1**; so no extra energy from respiration is needed **A1**.