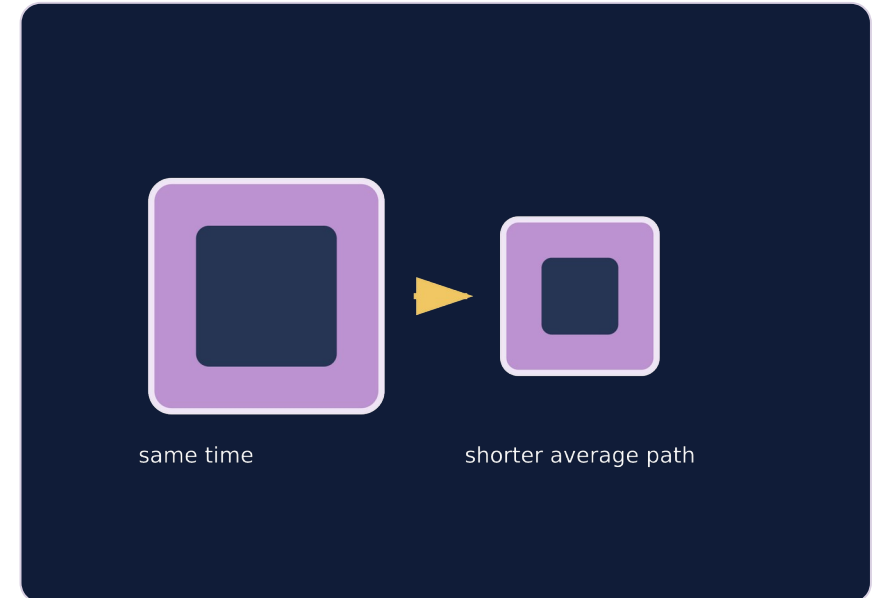


Explaining diffusion

I can select evidence and improve a diffusion explanation in an unfamiliar context.

Notice. Recall. Be ready to explain.

- 1 Define diffusion using 'net movement'.
- 2 What effect does a shorter diffusion distance have?



Retrieval answers

Make a prediction

A dye spreads through a gel cube faster when the cube is smaller. Which evidence matters most: colour, surface-area-to-volume relationship or the container label?

A Colour

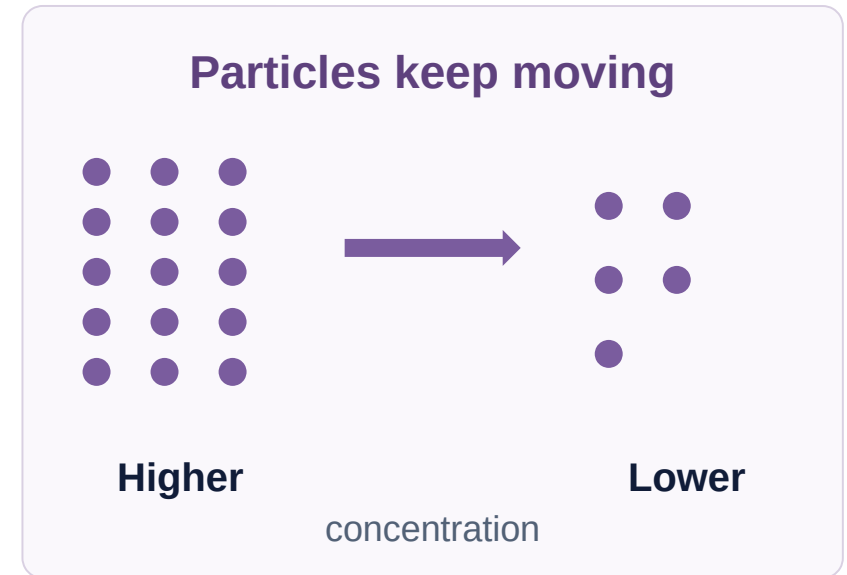
B Surface area and distance

C Container label

Commit, then check

Watch the model

- 1 Read the unfamiliar context and identify where concentration is higher and lower.
- 2 Select only evidence that changes gradient, distance, surface area or particle movement.
- 3 Build the causal chain before adding context words.



[View labelled diagram](#)

[Optional video](#)

Choose and justify

Which sentence explains rather than only describes?

A The small cube changed colour first.

B The small cube had a shorter average diffusion distance, so dye reached its centre sooner.

C The cubes were different sizes.

D The result was better.

Give the deciding clue before checking.

Check the reasoning

Connect the science

- 1 Evidence: smaller cube reached the centre sooner.
- 2 Science: shorter diffusion distance and greater surface area to volume ratio.
- 3 Consequence: dye reaches a larger proportion of the cube in the same time.

Illustrative crossings in equal volumes

Left → right: 8 Right → left: 2

Net left → right = $8 - 2 = 6$

At balance: $5 - 5 = 0$; motion continues.

Hold an evidence conference

Concentration difference, membrane and temperature are unchanged.

Model patch	Area / cm ²	Transfer / units per minute
A	10	4
B	20	8

Choose a pattern, explain it, then name one limit of this model.

Reveal shared reasoning

Your independent evidence

A medicine patch releases particles through the skin. A redesigned patch has the same concentration but a larger contact area. Explain why more medicine may diffuse across the skin each minute. State one piece of extra evidence that would strengthen the conclusion.

Optional support

Describe: what changes in the numbers? Explain: why does it change? Start: “When the area doubles, ____ because...”

Make one precise correction to the same work after feedback.

[Open worksheet pages](#)[Model after first attempt](#)

What changed in your thinking?

What is the difference between describing a diffusion pattern and explaining it?

- 1** Point to one improvement in your work.
- 2** Choose what you want to revisit.
- 3** Tell your teacher; agree the next step together.

Retrieval and prediction check

- 1 Net particle movement from higher to lower concentration, down a gradient.
- 2 A shorter distance increases exchange rate, other conditions unchanged.

Surface area and distance

[Return to Starter](#)

Check the deciding clue

The small cube had a shorter average diffusion distance, so dye reached its centre sooner.

Correct: evidence, scientific cause and consequence are linked.

Compare your reason. Correct one step if needed.

[Return to We Do](#)

Our shared reasoning

Area doubles, and transfer doubles in these model data. More surface allows more particles to cross at once. This does not establish real medicine doses or biological effects.

[Return to shared task](#)

Compare after your first attempt

A larger contact area provides more surface through which particles can diffuse at the same time. If a concentration gradient is maintained, this can increase the total net movement of medicine across the skin each minute. Repeated measurements of mass released per minute for both patch designs would strengthen the conclusion.

Use the model to improve your explanation in your own words.

[Return to independent task](#)

Your lesson resources

Worksheet pages are stored inside this PowerPoint.

[Worksheet · page 1](#)[Worksheet · page 2](#)[Standard PDF](#)[Supported PDF](#)[Depth PDF](#)[Editable Word worksheet](#)[Open online lesson / model](#)

Named files are in this week's folder. Online lesson and video need internet.

[Optional concept video](#)

Worksheet · page 1

Use your printed copy.
Keep the first attempt.

MADE BY MATT / LAUNCH SCIENCE

W4L3 | Evidence conference

Friday | 09:30–10:10 | Do | Editable pupil sheet

Name: _____ Date: _____

Core first. Write, speak, point or dictate your own words. Keep the first attempt so you can improve it.

Optional support: Describe: what changes in the numbers? Explain: why does it change? Start: “When the area doubles, ____ because...”

Work together

Read the controlled comparison below; it is illustrative model data, not a class experiment.

Illustrative model/sample data; not measurements made by this class.

Model patch	Contact area / cm²	Transfer / model units per minute
A	10	4
B	20	8

1. Describe the comparison using numbers.

2. Concentration difference, membrane and temperature are held constant. Explain the increase.

Return to task

Worksheet · page 2

Continuation is optional.
Improve the same work.

MADE BY MATT / LAUNCH SCIENCE

W4L3 | Continue and improve

Use after the core questions when directed

3. Does this prove that every real medicine patch should be doubled in size? Explain.

Optional transfer

Name a repeat measurement that would strengthen this comparison.

Depth: name an assumption or limit, then say what evidence would strengthen your answer.

Improve the same work

One correction I made, and why:

My request for next time: _____

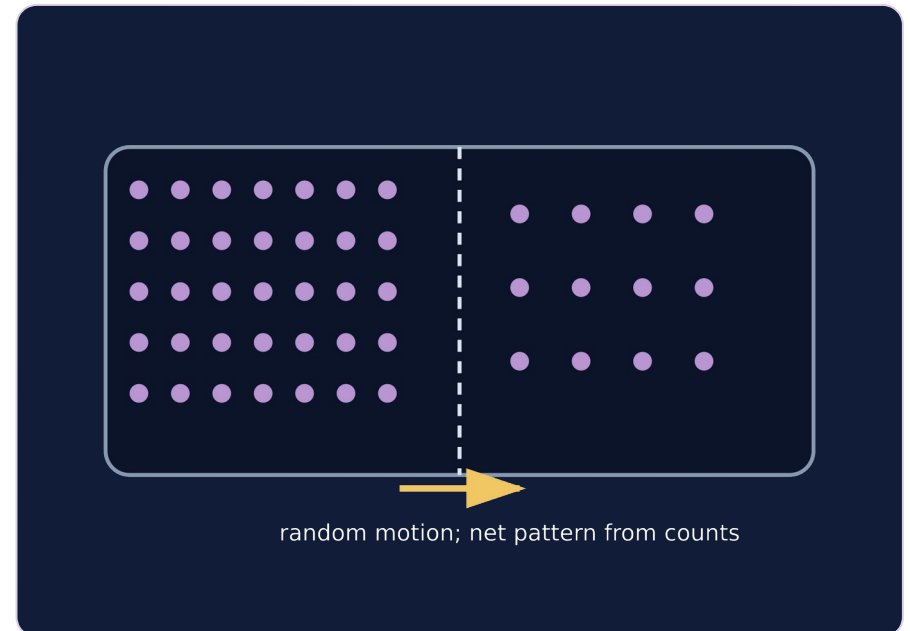
[Return to task](#)

Watch, pause and explain

Diffusion

What keeps happening when there is no net movement?

[Play freesciencelessons video](#)



No connection? Use the still model and explain the same question.

Look closely at the model

Command word decides the shape

► **DESCRIBE**

what happens

► **EXPLAIN**

why ... because

3 marks → 3 points

- 1 higher O₂ in the alveolus
- 2 so it diffuses down the gradient
- 3 wall one cell thick → short distance

A model illustration: use the stated data for calculations.

[Return to I Do](#)