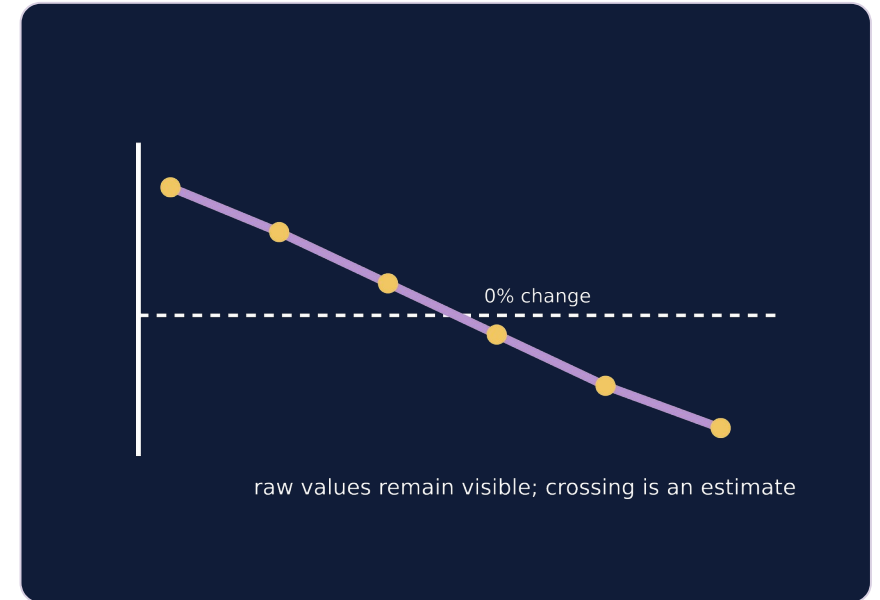


Reading osmosis data

I can calculate, graph and interpret osmosis data while keeping raw values and anomaly decisions visible.

Notice. Recall. Be ready to explain.

- 1 What does a negative percentage change mean?
- 2 Why keep an anomalous raw value?



Retrieval answers

Make a prediction

One repeat is very different from two others. Should it be erased, automatically excluded or investigated and kept visible?

A Erase it

B Automatically exclude it

C Keep it visible and investigate before deciding

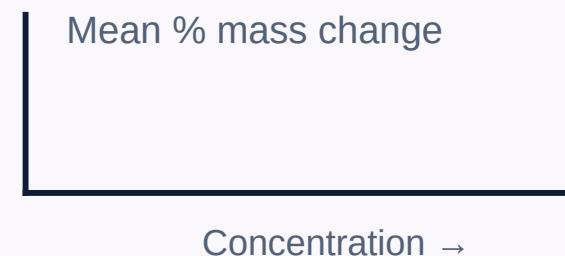
Commit, then check

Watch the model

- 1 Show every raw result before calculating a mean.
- 2 Flag an unusual value and record whether it is included, with a reason.
- 3 Plot concentration on the x-axis and mean percentage change in mass on the y-axis with units.

Keep every raw result

Raw values → Mean



View labelled diagram

Optional video

Choose and justify

What does a graph crossing near 0% mass change suggest?

A Osmosis has stopped everywhere

B The tested tissue and solution had little or no net water movement under those conditions

C The potato contains no water

D Every repeat must equal zero

Give the deciding clue before checking.

Check the reasoning

Connect the science

- 1 Description states the pattern in the plotted data.
- 2 Inference links the pattern to osmosis and the tested tissue.
- 3 Evaluation states how method or data could make the inference more secure.

Mass is evidence of net water movement

4.00 g → 3.60 g Change = -0.40 g

$(-0.40 \div 4.00) \times 100 = -10\%$

Negative change: net water loss from cells.

Keep the unusual result

Illustrative samples. Calculate the means; estimate where change is zero.

Sucrose / mol dm ⁻³	Repeat 1 / %	Repeat 2 / %	Repeat 3 / %
0.0	18	20	22
0.2	10	12	14
0.4	0	2	4
0.6	-10	-8	-6
0.8	-18	-20	-22

An extra repeat at 0.6 gives +9%. What should happen before excluding it?

Reveal shared reasoning

Your independent evidence

The mean percentage change falls from +12% at 0.2 mol dm^{-3} to -8% at 0.6 mol dm^{-3} . Estimate the concentration where change may be zero and explain why the estimate should be reported as approximate. Suggest one additional data point that would improve it.

Optional support

Find each mean: add the repeats and divide by their number. Describe the trend. Keep unusual results visible and explain any choice to leave one out.

Make one precise correction to the same work after feedback.

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

What changed in your thinking?

Complete: an anomaly is not automatically wrong because...

- 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 Mass loss relative to starting mass.
- 2 To investigate it and justify a mean decision; unusual does not automatically mean wrong.

Keep it visible and investigate before deciding

[Return to Starter](#)

Check the deciding clue

The tested tissue and solution had little or no net water movement under those conditions

Accurate and appropriately cautious.

Compare your reason. Correct one step if needed.

[Return to We Do](#)

Our shared reasoning

Means: +20, +12, +2, -8, -20%.

Nearest crossing: $0.4 + (2 \div 10) \times 0.2 \approx 0.44 \text{ mol dm}^{-3}$.

Retain and flag +9%; check the record and method before deciding. With it, the 0.6 mean is -3.75%.

[Return to shared task](#)

Compare after your first attempt

Assuming a straight line between the two means: $0.2 + (12 \div 20) \times 0.4 = 0.44$ mol dm⁻³. This is approximate because the real curve may not be straight and repeats vary. Test extra concentrations around 0.44 mol dm⁻³ with repeats.

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

W5L3 | Data detective

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: Find each mean: add the repeats and divide by their number. Describe the trend. Keep unusual results visible and explain any choice to leave one out.

Work together

Use class data if available; otherwise label this dataset “illustrative sample data”.

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

Sucrose / mol dm ⁻³	Repeat 1 / %	Repeat 2 / %	Repeat 3 / %	Mean / %
0.0	18	20	22	
0.2	10	12	14	
0.4	0	2	4	
0.6	–10	–8	–6	
0.8	–18	–20	–22	

1. Complete all five means. Describe the trend.

2. Estimate zero change using a straight line between the nearest values either side of zero.

Return to task

Worksheet · page 2

Continuation is optional.
Improve the same work.

MADE BY MATT / LAUNCH SCIENCE

W5L3 | Continue and improve

Use after the core questions when directed

3. An extra repeat at 0.6 gives +9%. What should you do before excluding it?

Optional transfer

Add the +9% repeat at 0.6. Find the new mean and explain its effect.

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: _____

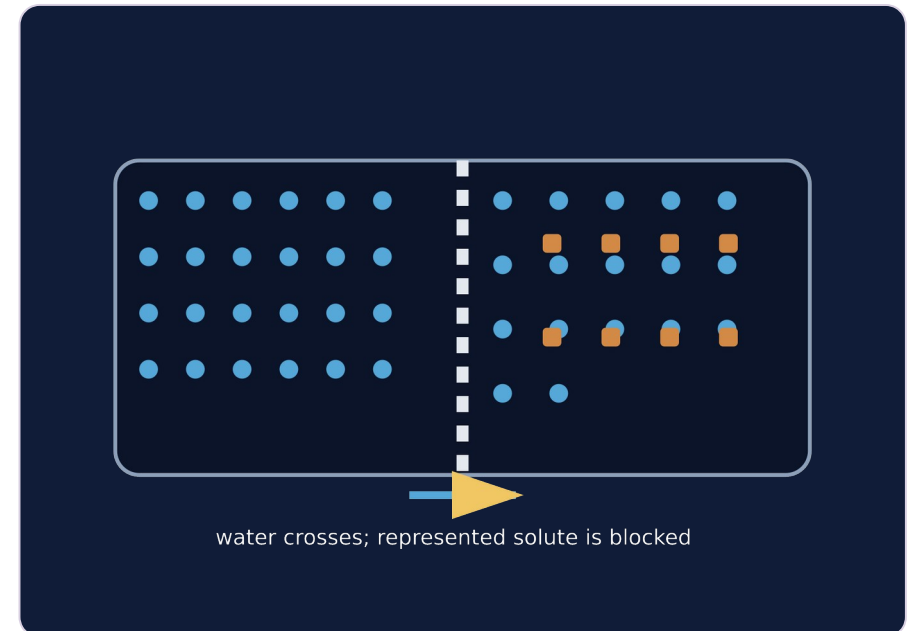
Return to task

Watch, pause and explain

Osmosis

Which substance moves, through what, and in which net direction?

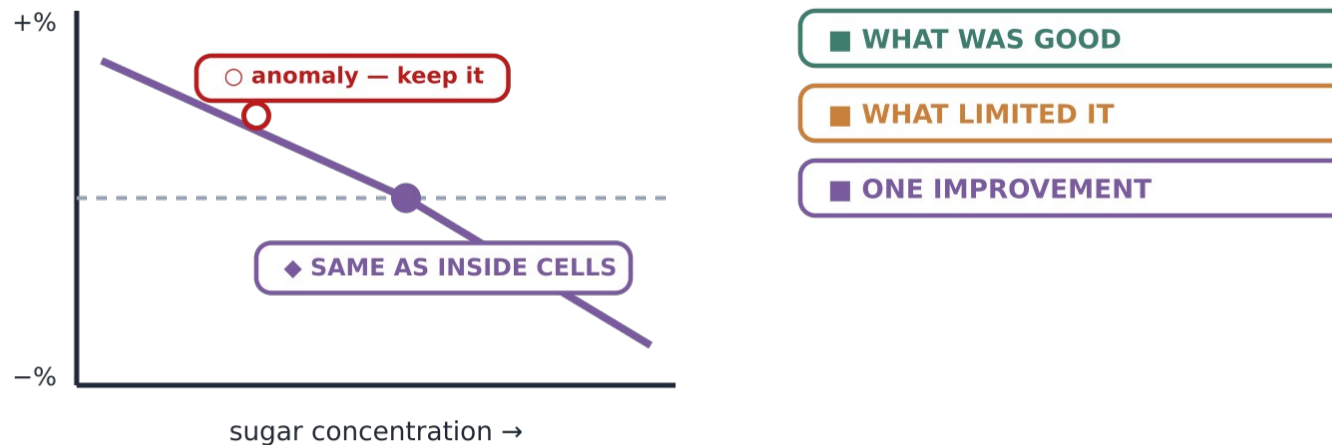
[Play freesciencelessons video](#)



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

Look closely at the model

Read the zero-crossing, then evaluate



A model illustration: use the stated data for calculations.

Return to I Do