

Can the use of digital badges enhance maths support?

Chrystalla Ferrier
Senior Lecturer
School of Life Sciences

UNIVERSITY OF
WESTMINSTER 



- Our maths support provision aims to equip learners with the skills to meet the maths requirements of their courses and their future careers.
- We are currently investigating the use of digital badges as a tool for increasing engagement and maths confidence.

Maths support for Life Sciences learners

- Level 3 – 10 week core skills activities and final assessment
- Level 3 and 4 – Provision of semester 1, weekly structured maths drop-in sessions
- Level 4 - Embedding of maths skills into module tutorials and Blackboard sites
- Level 5 – Statistics and use of SPSS, R, maths components of core and pathway specific modules in laboratory sessions and tutorials
- Levels 6 and 7 – Statistics use of research projects

Challenges with the weekly drop-in sessions

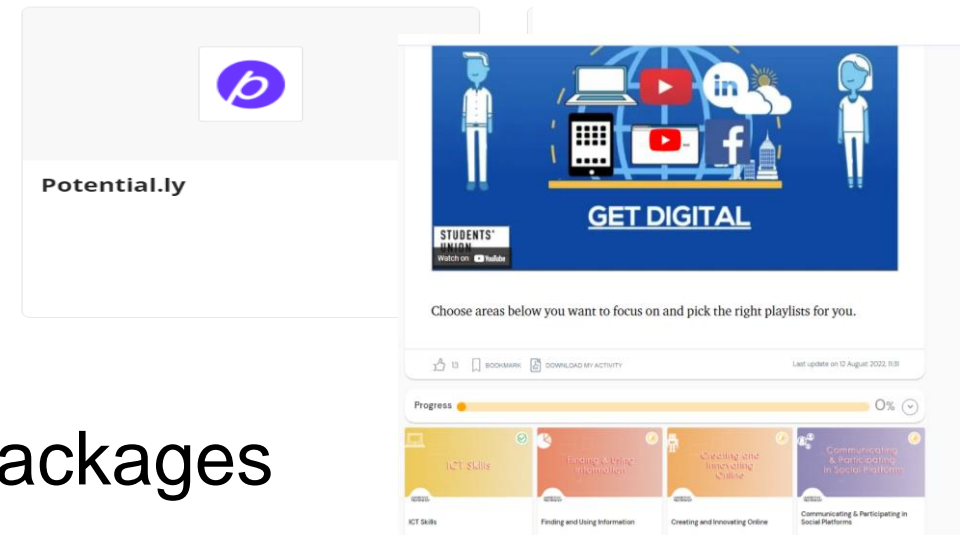
- Timetabling for availability of learners on the different courses
- Timetabling for availability of staff volunteers
- Learner awareness of these sessions
- Content located within a single module that may not be revisited

Also created/explored

- A bespoke reusable learning object for core maths skills (MSOR-CETL, Coventry, 2011)
- The use of gaming technology for core maths skills (MSOR-CETL, Glasgow 2018)

A new dedicated VLE Maths-Support area

- Following discussions on our on-line teaching forum a Maths-Support site has been set up on our VLE, Blackboard
- Will be available to all learners for the duration of their studies
- Will house content from current core maths activities but packaged using Potential.ly giving opportunity for digital badge acquisition



- Current successful use for digital skills packages

Maths-Support Blackboard site project group

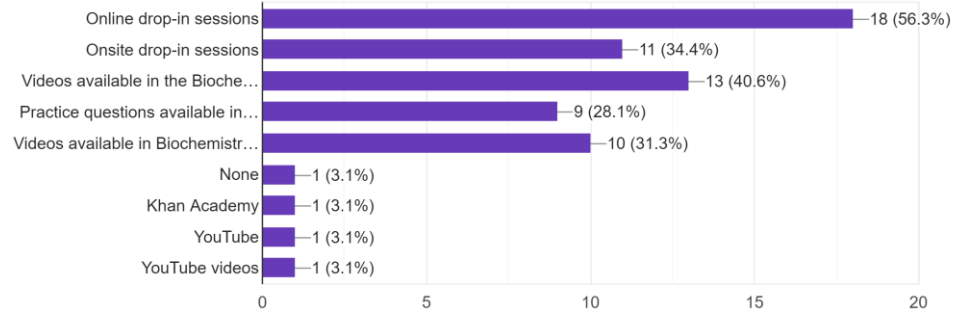
Representation from:

- Learning Innovation and Digital Engagement
- Disability Support
- Course Leaders
- Module Leaders
- Colleagues teaching maths and statistics and offering maths support

Learner questionnaire

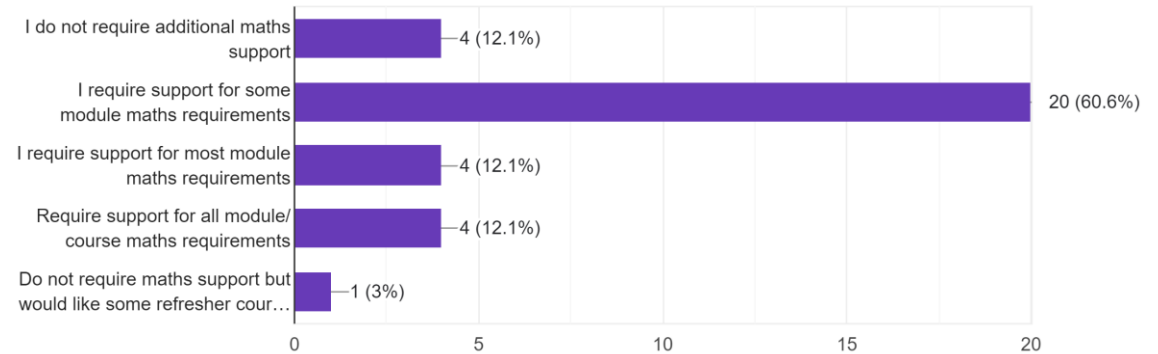
Which of the existing extracurricular maths support items have you previously used?

32 responses



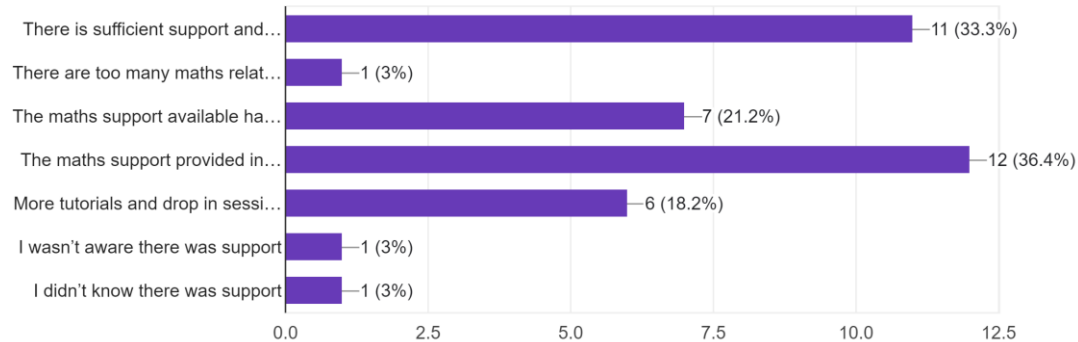
With respect to the maths requirements for your course, which is most applicable to you?

33 responses



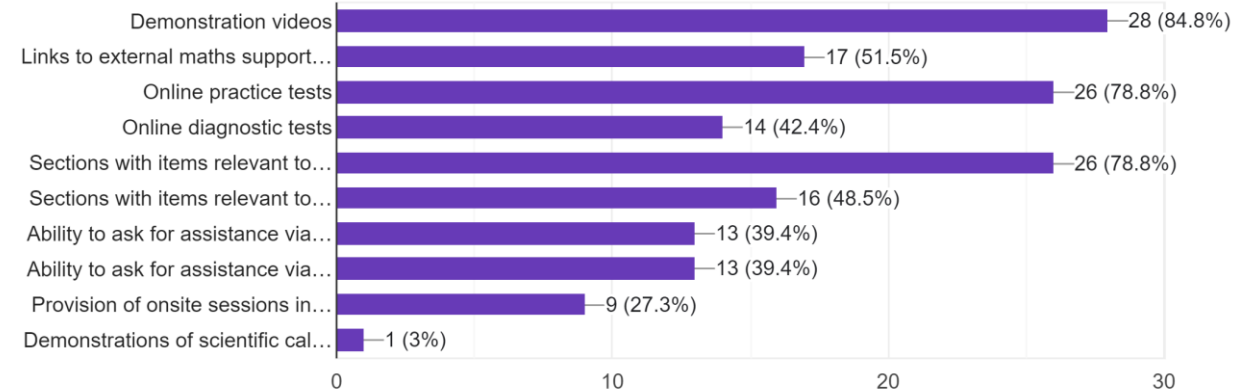
What are your views on the module maths support that has been provided so far for your studies?

33 responses



From this list, please select the items you would find most useful from a Maths Blackboard site.

33 responses



New VLE Maths-Support Site content

- Inclusion of current core maths skills content
- Addition of course and level specific content
- Links for reviewed external resources

.....possible optional diagnostic self-assessment?

- Colleagues would promote site to their personal tutees

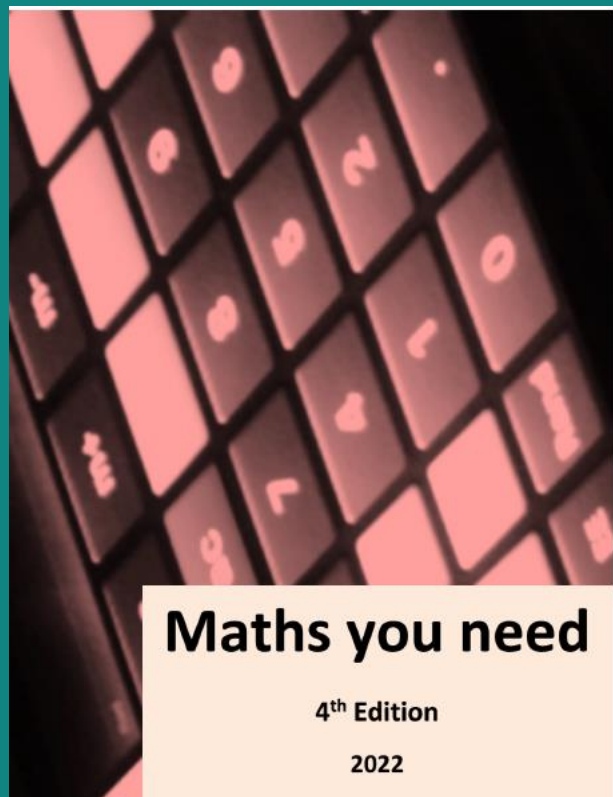
Key aspects of site design

- User friendly, bite-sized approach
- Clear signposting
- Standardised format for Potential.ly
- Core and specialised skills
- Quizzes for digital badge acquisition

- *Will incorporation of the digital badges increase engagement with course maths?*
- *Will incorporation of the digital badges improve learner abilities in maths and reduce maths anxiety?*

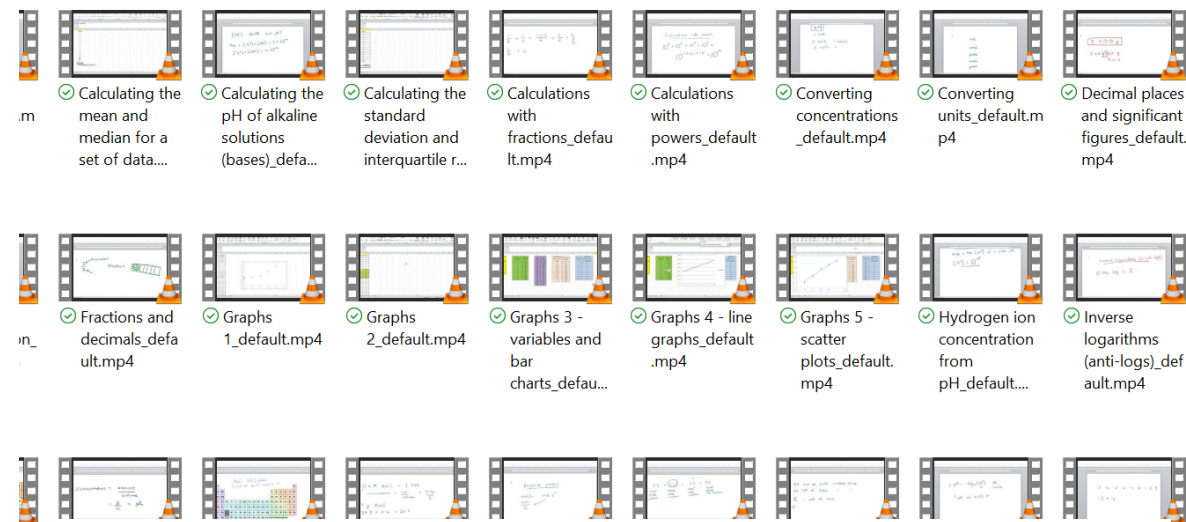
Starting with core maths

Use of some current resources



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Question 4

10 points

A stock solution of sodium chloride has a concentration of 140 **mmol/L**. To 3 significant figures, what is the concentration of this solution in **mmol/ml**?

Choose at least one correct answer

A 1.40 mmol/mL

B 1400 mmol/mL

C 1400000 mmol/mL

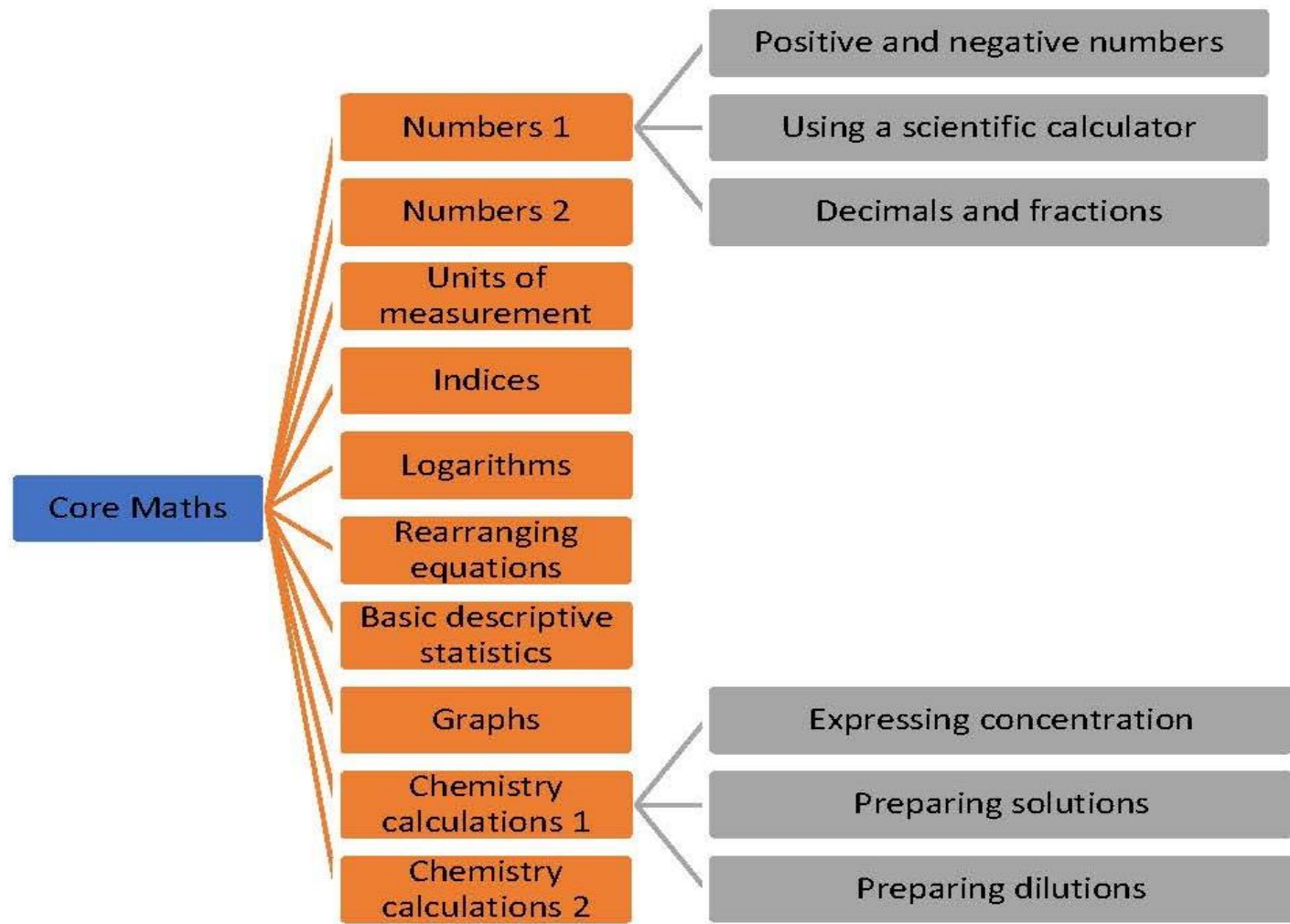
D 0.140 mmol/mL

✓ Content items loaded!

Correct answer

Initial planning for Potential.ly

Major Playlists	Mini Playlists	Cards		
		Card 1	Card 2	Card 3
Core Maths Skills	Numbers 1	Positive and negative numbers	Using a scientific calculator	Decimals and fractions
	Numbers 2	Rules for rounding numbers	Significant figures	Standard form
	Units of measurement	SI units	Unit prefixes	Converting units
	Indices	Powers	Roots	Negative powers
	Logarithms	Logarithms in base 10	Natural logarithms	Equations with logarithms
	Rearranging equations	Rules for rearranging equations	Rearranging equations examples 1	Rearranging equations examples 2
	Basic descriptive statistics	Accuracy and precision	Percentage	Central tendency and data dispersion
	Graphs	Types of graphs	Graph type selection	Presenting statistics on graphs
	Chemistry calculations 1	Expressing concentration	Preparing a solution	Preparing dilutions
	Chemistry calculations 2	pH calculations	pOH calculations	Preparing buffers



Development work 1

The screenshot shows a web-based course development interface. At the top, a light blue banner contains a back arrow, an information icon, and the text "This page has unpublished changes". To the right of this banner is a dark blue button labeled "Ready to publish?". Below the banner is a purple header bar with a home icon, the text "Core Maths Skills", and a pencil icon followed by three dots. The main content area features the University of Westminster logo and the title "Core Maths Skills". At the bottom of this area, there are icons for a thumbs up, a bookmark, and a download icon, with the text "BOOKMARK" and "DOWNLOAD MY ACTIVITY" next to them. On the far right, it says "Last update on 29 August 2022, 18:41".

Below the main content area is a toolbar with several icons in rounded rectangles: a close icon (X), a card icon, a link icon, an event icon, a playlist icon, a folder icon, a block icon, a diagnostics icon, and an "Insert card/playlist" icon.

At the bottom, there are three preview cards for course content:

- Chemistry calculations 1**: Features an image of chemistry glassware (flasks and beakers) with blue liquid. Below the image is the title "Chemistry calculations 1" and a small "UNPUBLISHED" button.
- Numbers 1**: Features an image of colorful 3D numbers. Below the image is the title "Numbers 1" and a small "UNPUBLISHED" button.
- Numbers 2**: Features an image of blue 3D numbers. Below the image is the title "Numbers 2" and a small "UNPUBLISHED" button.

Development work 2

The screenshot displays a digital workspace interface. At the top, a light blue notification bar states "This page has unpublished changes" with a "Ready to publish?" button. Below this, a purple header bar shows a home icon, the text "Chemistry calculations 1", and a pencil icon. The main content area features the University of Westminster logo, the title "Chemistry calculations 1", and a photograph of laboratory glassware. At the bottom of this section are icons for liking, bookmarking, and downloading activity, along with the text "Last update on 29 August 2022, 14:10".

Below the main document is an "Add" section with a plus icon. It contains three document thumbnails:

- Expressing concentration**: A dark blue thumbnail with a white document icon and the text "UNPUBLISHED".
- Preparing a solution**: A green thumbnail with a white document icon and the text "UNPUBLISHED".
- Preparing dilutions**: A light green thumbnail with a white document icon and the text "UNPUBLISHED".

Each thumbnail includes a small icon for liking, a pencil icon for editing, and a person icon for sharing.

Development work 3

Concentration is the amount of substance in a unit for amount is the mole (mol) and the SI (m³), but this is not 1 litre, one litre is equal to 1 dm³

There are a number of ways of writing one correct, and all mean the same thing:

1 mol/L
1 M (molar)
1 mol L⁻¹
1 mol dm⁻³

It is important to be consistent with term used and not to combine e.g. M/L does not mean moles per litre but means moles per litre per litre please never write as this!

Prefixes may be added as before, these are all ways of expressing millimoles per litre: 2 mmol/L, 2 mM, 2 mmol L⁻¹, 2 mmol dm⁻³

The units of concentration are therefore moles per litre, written as or mol dm⁻³. It is very important to write these units correctly, always including a space between the number and the unit, e.g. 0.7 0.75 mol/L, 0.75 mol dm⁻³.

Not all concentrations are expressed as SI units. For example if the is a mixture of different molecular mass items, such as a mixture

This card has unpublished changes [Ready to publish?](#)

Page 1 Started - 29/08/2022

Chemistry calculations 1 > Expressing concentration

University of Westminster

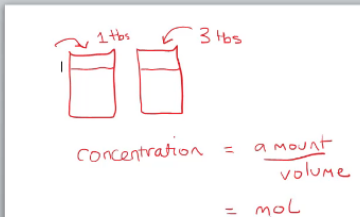
Expressing concentration

Document - Microsoft Word - non-commercial use

1/5:14

Download

Next Page >



Please attempt the following multiple choice questions. You can attempt as many times as you like.

Which of the following is correct for expressing a three moles per litre solution?

3 mol/L

3 m/L

3 M/L

3mM/L

3 molar/mL

PREVIOUS

NEXT

How will learners achieve a digital badge?

- Envisage a digital badge for the completion of a major playlist and all associated quizzes, with core maths skills as the starting point.

Next steps

- Continue building site
- Complete Core Maths playlist and publish
- Pilot Digital Badges with learners and colleagues
- Add more advanced playlists
- Review learner use and outcomes

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Thank you for listening

Any questions?

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