WARWICK
THE UNIVERSITY OF WARWICK

GCSE
RESIT HUB

PROMOTING SUCCESS FOR GCSE MATHS RESIT LEARNERS

WELCOME!

24th June 2024

Introductions and Background

- Who are we? - introductions and roles.
- Recently completed an EEF-funded ‘Practice Review’ about GCSE Resits.
- Clear that there is real interest in this area, from post-16 teachers and leaders, policymakers, families, sector organisations. Also, more research needed!
- Connecting with other research and interests e.g. evidence-informed practice; education and social policy; collaboration and research *with* practitioners.

Aims of the session

- What are the Spotlights for?
- The wider GCSE Resit Hub work: https://gcseresits.education/
- Connecting research and practice on GCSE resits
- Partnerships and collaboration between Post-16 sector and HE
- Being part of a conversation – learning from other settings/people, contributing your perspectives and experiences.
- A springboard to further work and dialogue in this area

Running order

- Introductions and welcome (4.00-4.10pm)
- What do we know about Maths resits from the research? (4.10 -4.20pm)
- Guest speakers:
  - **Aidan** – Successfully supporting staff autonomy in planning and sequencing (4.20-4.30pm)
  - **Em** - MEI initiatives for supporting progress in maths (4.35-4.45pm)
  - **Mark** – Automaticity: gateway to reasoning & problem-solving (4.50 - 5.00pm)
  - Q&A, what's next, feedback (5-5.15pm)

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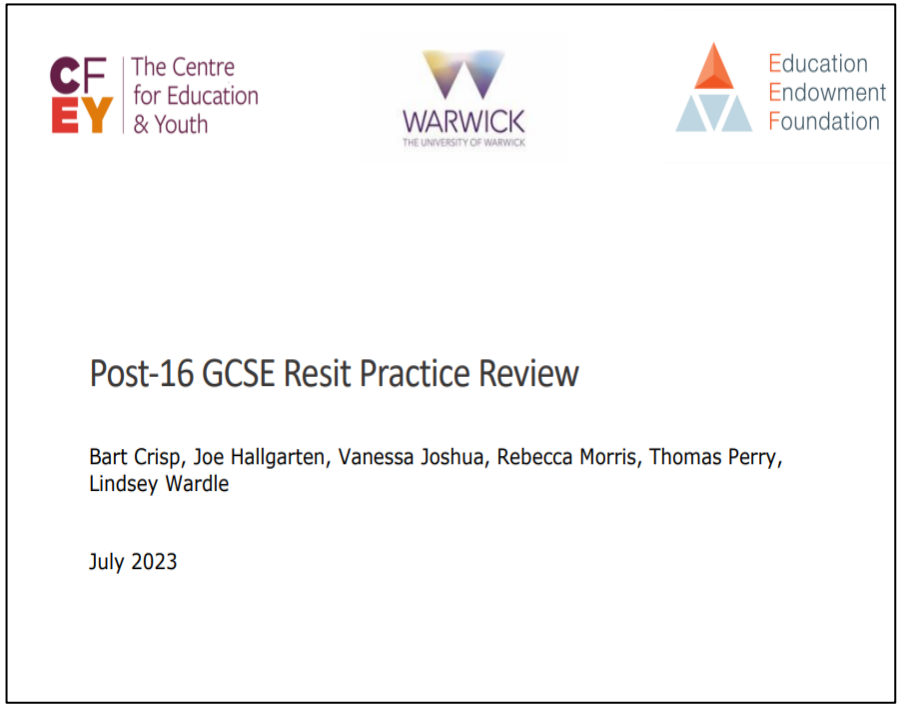
What does the research tell us?

The EEF Practice Review (2023)



Overview of study

- A ‘practice’ review – focused on understanding what is known about post-16 resit practices in colleges/schools.
  - **Desk-based review** of existing literature, to build an understanding of interventions, map common practices and policies (n=59 studies included).
  - **Leader and practitioner interviews**, to understand drivers of successful practices and approaches, and explore barriers to further progress.
  - **Site visits with student focus groups**, to gain a more granular understanding of how successful practices impact on student achievement and engagement.

What did we find?

- N=59 pieces of research literature included in the review.
- Subject focus of the literature:

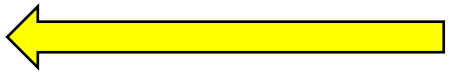
	Freq.	Percent
English	5	8.5
Maths	40	67.8
Both	10	17.0
General/unclear	4	6.8
Total	59	100.0*

- More maths than English-focused studies.
- Maths studies include 30 action research projects facilitated by Centre for Excellence in Maths (CfEM) in 2020-21.
- Nearly ¼ pieces looking at 'both' subjects or 'general' post-16/resit practice work.

Analysis themes

- Five main analysis themes by subject focus

Subject Focus	Curriculum and pedagogy	Resources and technology	Leadership and organisation	Learner needs, backgrounds and experiences	Teacher needs, supply and development
English	4	2	0	1	2
Maths	29	16	4	21	7
Both	5	4	2	7	2
General/ unclear	3	1	1	1	1
Total	41	23	7	30	12



Summary of Maths and ‘both’ studies

- A range of maths topics considered, including those ranging from ‘high level’ organisational/curriculum work through to more specific exploration of particular areas of knowledge or skill development (e.g. problem-solving, multiplication).
- Considerable focus on supporting engagement and motivation as research outcomes. Some studies looked at attainment too.
- Evaluation of some established maths interventions e.g. 5Rs, Realistic Maths Education (RME).
- Lots of focus on online approaches (perhaps due to Covid context) – flipped learning, blended learning, apps. Limited conclusions to be drawn on student outcomes.
- New, larger-scale projects currently underway – e.g. see the EEF website (next slide) for further details.

New/ongoing EEF Post-16 Projects

- Link here

Effectiveness Trial: In Progress

Mastering Maths (trial)

University of Nottingham

Accelerator Fund

Project in Progress
Project Recruiting (England)

Efficacy Trial: In Progress

Maths-for-Life

University of Nottingham

Post-16

Project in Progress
Participating settings: 100

Efficacy Trial: In Progress

The 5Rs approach to GCSE Maths resits (21/22 and 22/23 trial)

Association of Colleges

Accelerator Fund

Project in Progress
Participating settings: N/A

Pilot Study: In Progress

Tutor Trust (pilot)

The Tutor Trust

Project in Progress
Project Recruiting (Regional)

- Additional funding for EEF to support evidence-informed practice in post-16 contexts (link)

Reflections from teachers and young people

"A big part of the problem is the lack of maths specialist teachers working to support learners to progress in GCSE maths. However, this is a reflection of a wider national issue in terms of attitudes to maths and numeracy, as there is a widespread acceptance of poor numeracy, which hinders a focus on learning maths and then the supply of people with the capacity to support it." Senior leader

"They try and make sure that everyone has peace of mind where they can do it without stressing, and that's what I kind of prefer to have, really, because when I was in secondary school, there wasn't really much communication, it was more, 'Oh, are you all right?' 'Oh, yeah.' 'Okay, good. We'll just send you on your way.' But here it's, you came for a talk about it." Young person

Reflections from teachers and young people

"So, we'll go through and we give a little diagnostic test… based on the topic and then the teacher will know roughly where the strengths and 46 weaknesses are and we can then have a sense of what the kids already know because [teaching what they already know] just adds to the kids being disengaged or apathetic towards maths…if we're just focusing on the areas that are missing, the gaps in the learning, that will somewhat help… But we're finding it very difficult to get that implemented this year." Teacher

"I think most of the kids are just disengaged; they're being forced to do the qualification they don't want to do. One thing I've tried to change this year at college is how maths is framed to seem. Because most colleges position maths as an add-on… I was trying to try my hardest to try and frame maths as if it's like it's part of the BTEC course." Senior leader

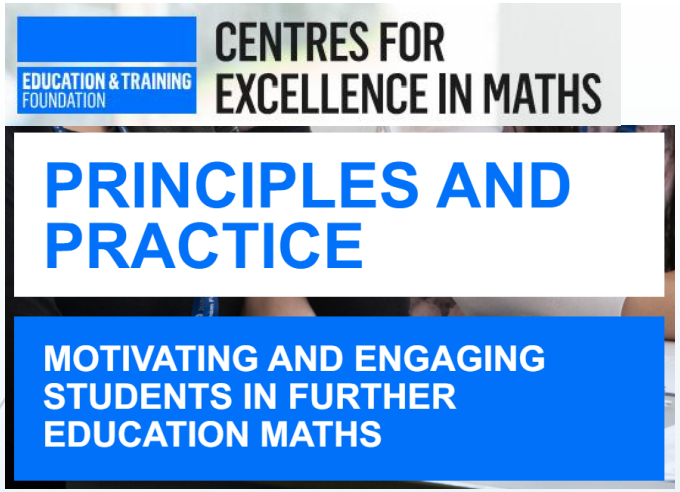
But what *can* we do?

- Draw upon and build on effective principles and practice from successful post-16 contexts.
- Look to promising/existing knowledge and evidence from other sectors (e.g. KS4, Higher Education).
- Connect with other leaders, practitioners and networks – share best experiences, practice, collaborate, challenge.
- Reflect upon what we *really* want to achieve (aims/outcomes) and the 'best' ways to get there.
- Rigorously evaluate practice – openness to improvement, development and change.

Successfully supporting staff autonomy in planning & sequencing

Aidan Batey

GCSE Resits Spotlight Event
24th June 2024



1. *Great learning environment*
2. *Link to students' interests*
3. *Adapt to ways of working*
4. *Awareness of progress*
5. *Relevance of maths*

STAFF AUTONOMY IN PLANNING & SEQUENCING

Negative prior experiences and failures
-Low expectations of success

Lack of belonging
- Feeling uneasy or uncomfortable in their maths class, or intimidated

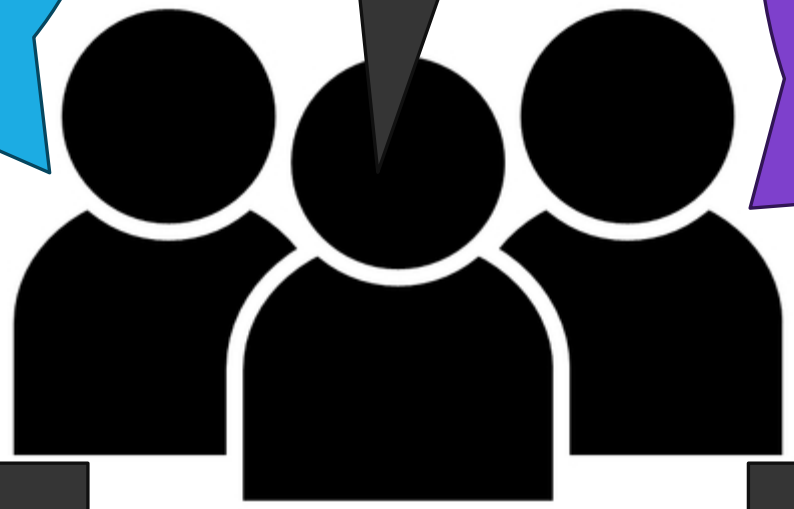
Anxiety about maths and/or taking a maths exam
-Intrusive negative thoughts affect cognitive capabilities

Negative cultural attitudes to maths in society and peer pressure.
- Failure to see relevance of maths

I'm not sure which I'd prefer to start with; algebraic manipulation or area. I'll use my initial assessment results to determine what they need more time on

Let's start with a practical activity on finding the area early on in the year, it'll be a great way to engage students. I'll work with them on algebra once I have them onside!

I'll go over algebraic manipulation first so they can then apply those skills on area problem solving questions



Who is correct?

How should we sequence these?

STAFF AUTONOMY IN PLANNING & SEQUENCING

Coherent: having clarity

FE Inspection Handbook

Quality of education
Outstanding (1)

- The work that learners do over time embodies consistently demanding curriculum goals. It matches the aims of the curriculum in being coherently planned and sequenced towards cumulatively sufficient knowledge and skills for future learning and employment.

Good (2)

- The curriculum is coherently planned and sequenced towards cumulatively sufficient knowledge and skills for future learning and employment.

Being coherent is much easier when you are invested in an approach that you believe in!

The Learning Rainforest : Tom Sherrington

Rainforest Thinking

- High trust, high challenge culture
- Range of approaches adopted
- High level of autonomy with teachers
- No ‘right way’ but recognition there is still ‘bad practice’
- Has to still have quality and rigour

Successfully supporting staff autonomy in planning & sequencing

Maths Teaching staff

- Staff can sequence their delivery to match their coherent rationale
- Encouraged to ensure that they have clarity on the expectations on planning and sequencing
- Asked to review previous planning & sequencing against FE framework using process from leadership to support consistency
- Provided opportunities to discuss coherent rationale behind their decisions with TLI staff, maths leadership and each other

Maths Leadership

- Be strong practitioners who understand the reasons why sequencing and planning may differ
- Acceptance and patience when some approaches need time to embed
- Sharing best practice when seen through scrutiny
- Speedy actions where required – but not micromanaging
- Recognising the benefits this approach has overall

Feedback from my staff regarding their autonomy in planning and sequencing

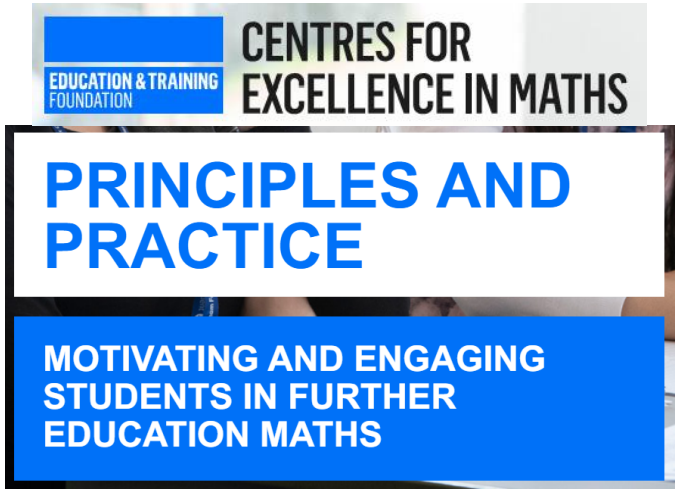
→ *"It allows me to react to the students' needs and change things as appropriate."*

→ *"I am more motivated and enthusiastic in my job because I have this autonomy."*

→ *"It is a positive that we have a choice to collaborate but it is not enforced reducing conflict between staff who have different strong opinions on ordering."*

→ *"Autonomy enhances creativity & innovation, tailors personal teaching style to lessons, and adapts better to students personalised needs."*

→ *"A big reason why I was interested in working here"*



1. Great learning environment
2. Link to students' interests
3. Adapt to ways of working
4. Awareness of progress
5. Relevance of maths

Successfully supporting staff autonomy in planning & sequencing

Aidan Batey

GCSE Resits Spotlight Event
24th June 2024

Thank you!

Mathematics ® Education Innovation

FE Maths Challenge

2024/25


United
Durham
Isle of Man
Norwich
Cambridge
Cardiff
Bournemouth
English Channel


HER
MATHEMATEG AB
METAL SEAGULLS
Valero
MEI
Port of Milford Haven

MEI
FIRST PLACE

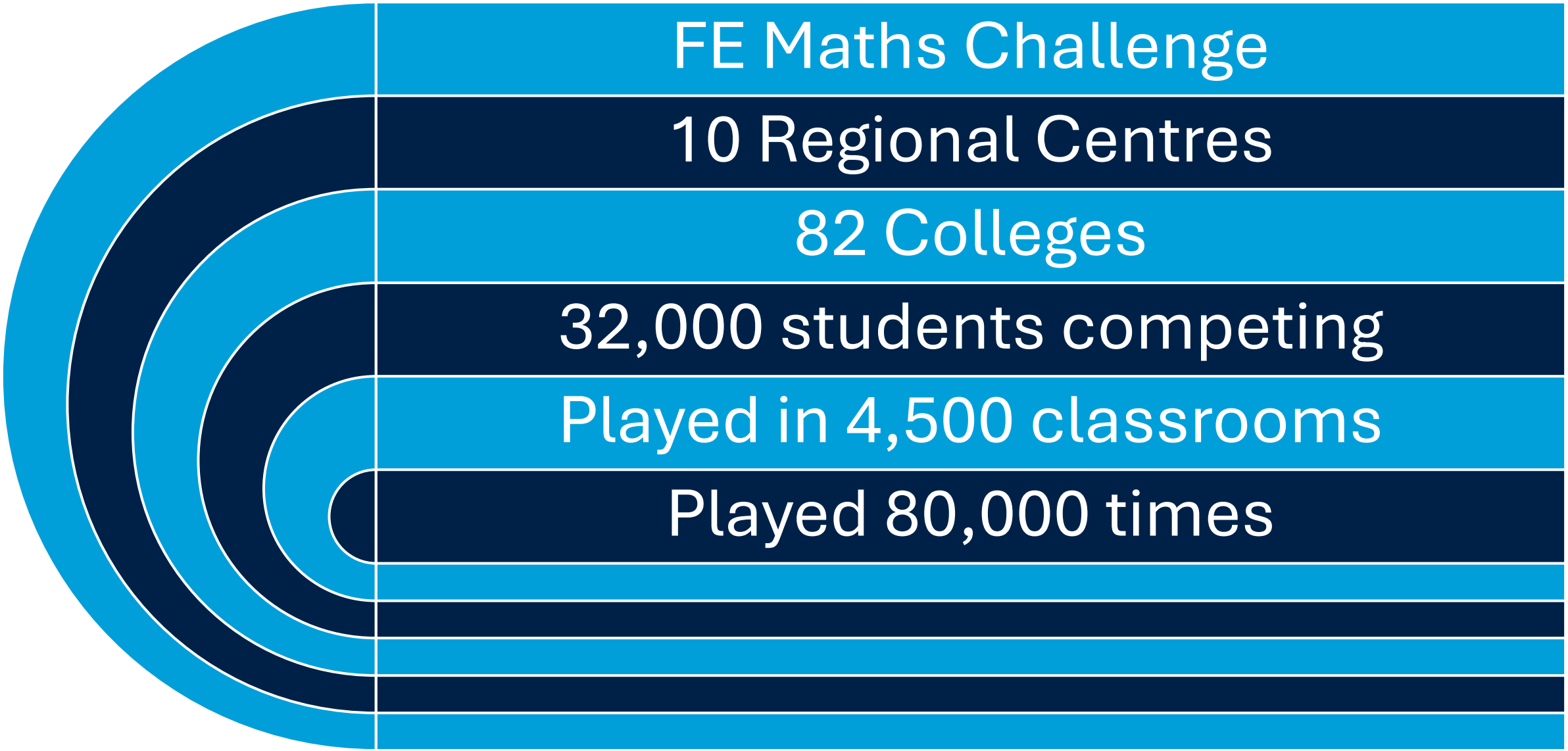

CTK EMMANUEL
A CHRIST THE KING SIXTH FORM
UT VITAM HABEANT


1st
2nd
3rd


LEICESTER TIGERS
WELFORD ROAD


SCARLETS


THE ATYEO STAND
BRISTOL


FE Maths Challenge
10 Regional Centres
82 Colleges
32,000 students competing
Played in 4,500 classrooms
Played 80,000 times

Mathematics Education Innovation

FE CPD Programme


STOP


MEI
Mathematics
Education
Innovation
integral
MEI CONFERENCE 24
Home
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Teachers
Students
Universities
Employers
Support Us
Teachers > Functional Skills & GCSE resit > FE Maths CPD Programme
FE Maths CPD Programme
What is the FE Maths CPD Programme?
The FE Maths CPD programme is an extensive professional development programme funded by the Department for Education. It's designed for teachers of students aged 16 – 19 years who are working towards achieving grade 4 or higher by resitting GCSE Mathematics or studying Functional Skills Maths.

Mathematics Education Innovation

NCETM

P16 GCSE/FSQ

FE Mastery Specialist Programme

MORE places available for Cohort 2, starting in September 2024

Draws upon the successfully established Primary and Secondary Mastery Specialist Programmes, but examines everything through an FE LENS

Year 1: Specialist's own development
Year 2 + : Establishment development

Time commitment in Year 1?

15 Days

6 days central training
9 days own development time

Fully Funded

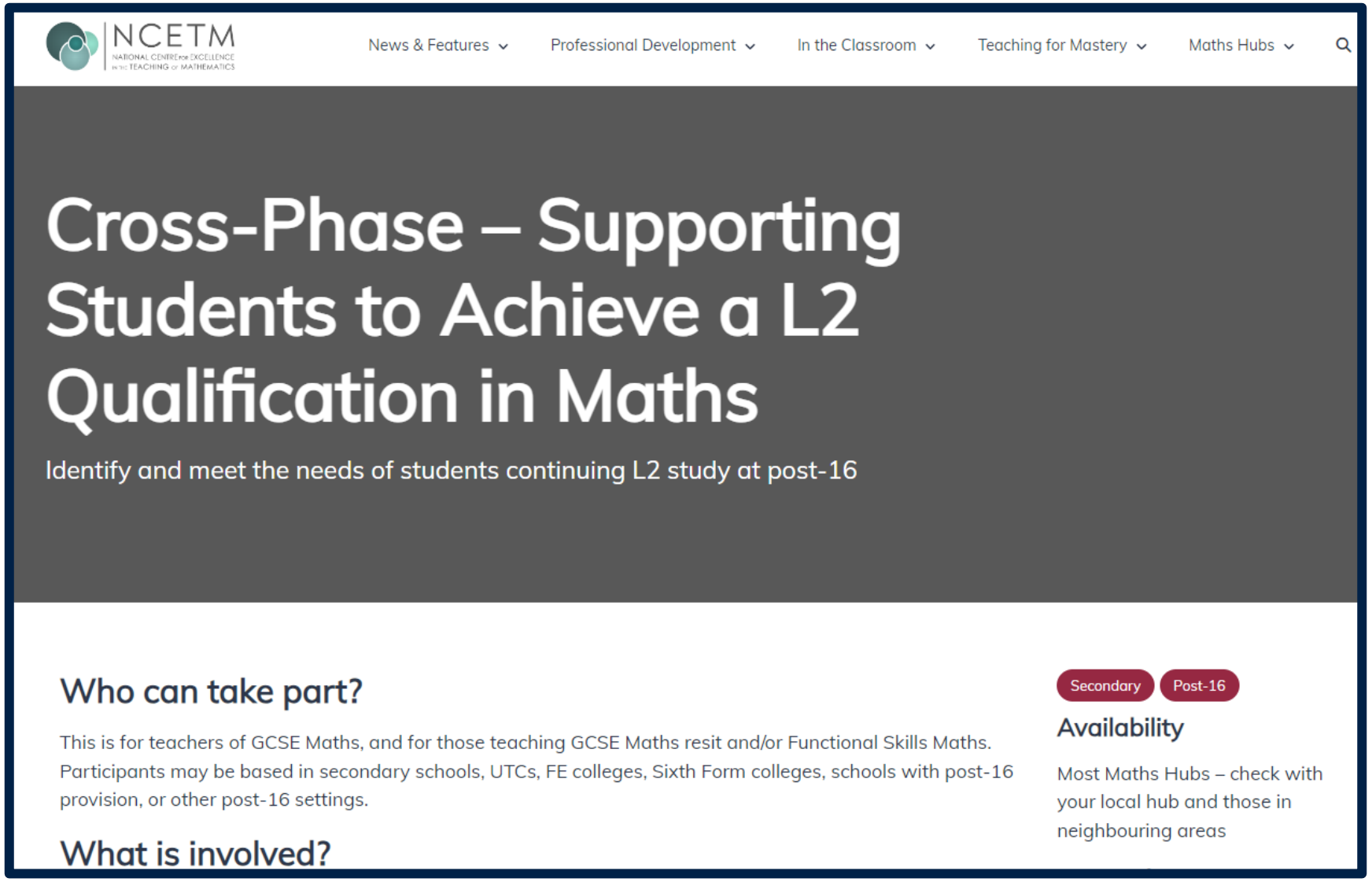
£400 per day

Current specialist:

"I'm more aware of being part of a big picture for teaching maths in FE. It encourages me to try different approaches that could engage students better than before.

It's great to be part of a network of maths teachers that encounter similar day-to-day stories."

Closing soon!



Comma, not a full stop.

Mathematics ®
Education
Innovation

bit.ly/ebjune24

Automaticity:

gateway to reasoning & problem-solving

Mark Stewart
24.06.24

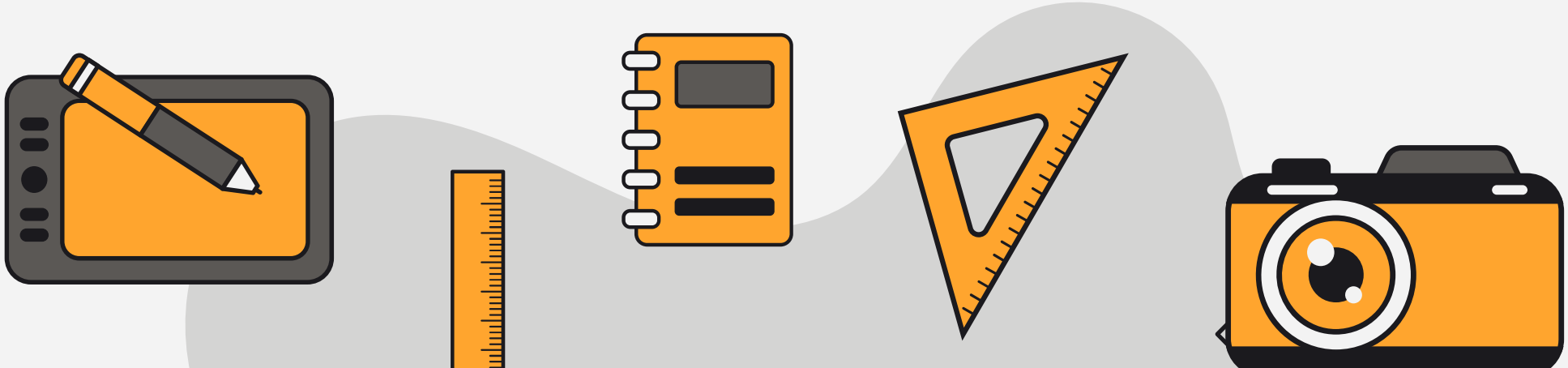
“**Automaticity**”

- an automatic response pattern, or habit

Immediate, effortless recall of arithmetic facts, formulae & processes, and timely application

The wider problem

- Lack of automaticity begins in primary school e.g. place value, 4 ops
- Learners see peers succeed and decide that maths is ‘not for them’
- Vicious cycle of disengagement, lack of progress & failure
- School system not designed to help those struggling most



The wider problem

- Addition and subtraction fact-retrieval speed predicted performance on word problems
  (Kail & Hall, 1999)

- Fact-retrieval speed predicted performance on a broad range of math questions on standardised tests, including items focused on conceptual understanding, data interpretation, and reasoning
  (Royer et al., 1999)

- Longitudinal study of 300+ students … showed that fact-retrieval from long-term memory in early years predicted eventual membership in high or low achieving groups
  (Geary et al., 2009)

Math Facts:

$$\frac{3}{8} + \frac{5}{6} = \frac{9}{24} + \frac{20}{24}$$

$$\frac{29}{24} = 1\frac{5}{24}$$

Learners may arrive at a correct solution, but after significant time and cognitive load

Number of math facts needed:

Finding the lowest common denominator

1. 8 × 1 = 8
2. 8 × 2 = 16
3. 8 × 3 = 24
4. 6 × 1 = 6
5. 6 × 2 = 12
6. 6 × 3 = 18
7. 6 × 4 = 24

Converting the fractions

8. 24 ÷ 8 = 3 (or 8 × 3 = 24)
9. 3 × 3 = 9
10. 24 ÷ 6 = 4 (or 6 × 4 = 24)
11. 5 × 4 = 20

Adding the fractions

12. 9 + 20 = 29

Converting to a mixed number

13. 24 goes into 29 once...
14. with 5 left over (29 − 24 = 5)

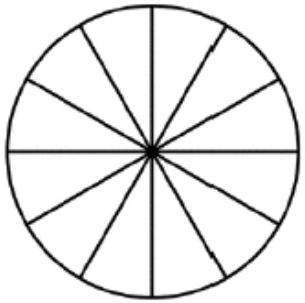
Math Facts?

Asim and Fee both ate from separate pizzas. Both pizzas had 12 slices.

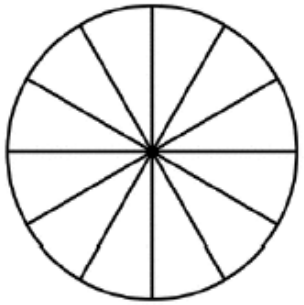
Asim works out that he has eaten $\frac{2}{3}$ of his, and Fee works out that she has eaten $\frac{5}{6}$ of hers.

a. shade in the fraction each has eaten below:

Asim



Fee



(2)

b. how much pizza have they eaten between them in total? Simplify your answer.

.....

(2)

(Total for question is 4 marks)

Reserve cognitive effort & time

Freeing the prefrontal cortex from computational load makes valuable processing resources available for more complex problem solving and reasoning.

This is a key factor in promoting mathematical learning and skill acquisition.

Menon, 2010

Benefits

- Deepens understanding
- Reduces cognitive load & frees working memory
- Mental resources saved for challenging problems:

  50% of exam marks are AO1, 50% are AO2/3
- Significant savings in time
- Increased accessibility & willingness to attempt AO2 & AO3 questions
- Learners can focus on reasoning & problem-solving questions
- Increased confidence, reduced stress & anxiety
- Improved exam performance

Strategies

Time & opportunity to practise

Strategies

1. **Flipped learning gives learners a chance to start practising automaticity of skills after consolidating vocabulary & retention in a low-stakes environment, ready to apply in class**

Strategies

2. **Longitudinal approach: regular practice in class via structured Starter Activities**

Starters

- **Learners practise AO1 skills in *every* session (10 mins)**
- **Immediate marking and feedback (5 mins)**
- **Structure & initiation behaviours**
- **Results tracked & patterns identified (AfL)**

Starters

week 24 – set A

Q No.	Topic	Sub-topic	Question	Answer
1	Advanced Number	Standard Form	Write 1.2×10^3 as an ordinary number	
2	Advanced Number	Standard Form	What is 2000 in standard form?	
3	Advanced Number	Indices	Estimate $\sqrt[2]{57}$	
4	Advanced Number	Percentages	Convert 130% to a fraction	
5	Proportion	Direct Proportion	If 10 batteries costs £3.50, how much should 8 identical batteries cost?	
6	Proportion	Ratio	Share £90 in the ratio 3:2	
7	Algebra	Expanding	Expand $4(x-5)-6(x-2)$	
8	Algebra	Graphs	What is the midpoint of the straight line drawn between the coordinates (4 , 0) and (9 , 8)?	
9	Geometry	Angles	What is the measure of each exterior angle of a regular heptagon?	
10	Geometry	Volume	A triangle with base 16 cm and height 8 cm, has the same area as a square. What is the perimeter of the square?	

Results

- Performance improves rapidly
- Confidence & resilience also increase
- Misconceptions & skills-gaps identified and addressed
- Areas for development identified & actioned
- Ability to access & answer AO2 & AO3 questions is improved

References

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- Saliency, switching, attention and control: a network model of insula function. Vinod Menon and Lucina Q. Uddin, 2010.

QUESTIONS AND DISCUSSION

What have you got from this event?
Will it inform your practice going forward?

Please answer our very short survey (1-2mins).

Submissions are anonymous and no individual responses will be shared.

See link provided in the chat, or click link to survey:
https://warwick.co1.qualtrics.com/jfe/form/SV_0P74TCz4c7TkFAq

Stay with us for some final thoughts and information.

Coming up…

- One more Spotlight session (3rd July) – motivation and engagement
- Ongoing development of the GCSE Resits Hub website: https://gcseresits.education/ - we will be in touch with everyone here about ideas/contributions you might like to make.
- Professional development workshops around practitioner research and GCSE resits.
- Policy dialogue – involving practitioners/leaders. To inform policymakers of current situation, challenges and needs around post-16 resits.
- A writing competition for English GCSE Resit learners.

THANK YOU!

- Keep in touch – if you'd like to learn more about the GCSE Resits Hub project and/or get involved, you can:
- Visit our website – https://gcseresits.education/
- Follow us on LinkedIn/Twitter - @GCSEResit_Hub
- Email us: rebecca.e.morris@warwick.ac.uk
- Sign-up for our mailing list via the QR Code

GCSE Resit Hub Mailing List