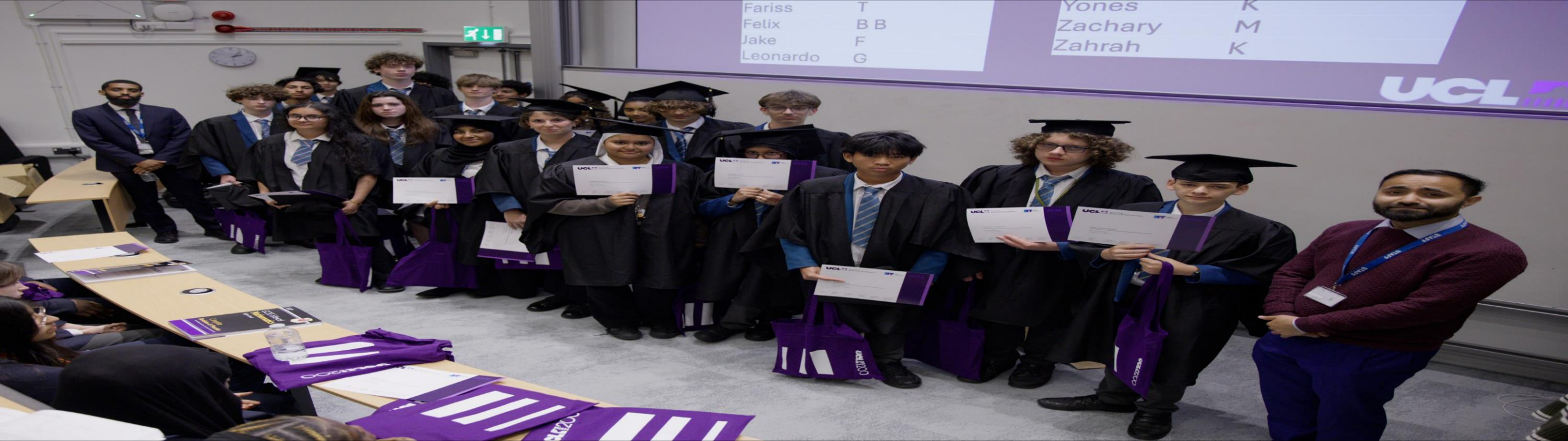




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Jake	F
Leonardo	G

Yones	K
Zachary	M
Zahrah	K

UCL

Designing for Impact: Telling the story of UCL Accelerate

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What we will cover today slide?



- Why we do this work – and how we approach it
- The design principles behind the Accelerate project
- An overview of the Accelerate project
- Our school partnership model
- Tutors as educators
- Reflections on rigorous evaluation: what it adds and what it complicates

UCL Widening Participation



Access and Widening Participation

Purpose

Supporting young people up to Year 11 to raise attainment, access guidance, and progress to higher education — with targeted support for priority groups, parents, and carers.

What We Aim to Achieve

- Higher attainment through sustained programmes
- Broader access to HE for underrepresented groups
- Increased applications from priority students

Who We Work With

- Non-selective, lower-performing schools
- First-generation to university
- FSM / Pupil Premium eligible
- From low HE progression or high deprivation areas
- UCL priority groups

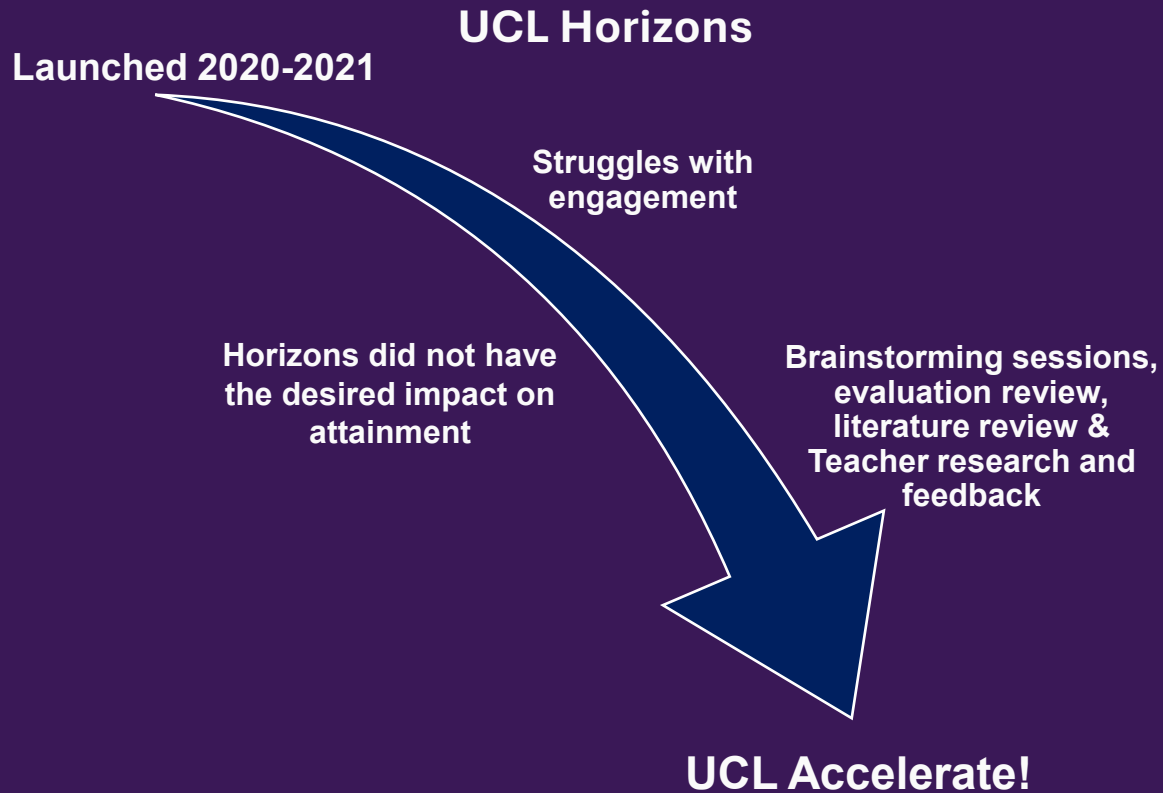
Why do we work on improving school attainment?



- Attainment is consistently the strongest predictor of progression to higher education, especially for students from underrepresented backgrounds
- Universities face growing expectations to demonstrate measurable impact in outreach activity
- Traditional aspiration-raising approaches alone are insufficient to shift outcomes
- There is an increasing need to design programmes that directly support educational attainment

- *When disadvantaged students achieve the same levels of attainment as their advantaged peers at age 16, they are almost equally likely to go to higher education*
- *There is a clear link between academic attainment in schools and colleges, and access to higher education (BeyondAccess 2017)*

Journey to UCL Accelerate



- Our first attempt to support in-school maths attainment came in 2020 with the launch of the Horizons programme
- Developed during COVID-19 as a fully online offer
- Challenges with engagement and impact led to the decision to discontinue and redesign
- This informed the development of a more impactful, evidence-led programme: UCL Accelerate

How we designed Accelerate:



We began by asking a simple question: **What are we trying to achieve?**

- Programme design began with identifying specific educational barriers, not delivery preferences

Research was used to understand:

- Where the strongest evidence of impact exists
- Which approaches are most effective in similar contexts

From this, we undertook:

- A thorough literature review
- Commissioned research with teachers across the UK
- Utilised Schools as co-creators of the project
- Delivery of a pilot year

What did this show



Some key principles emerged through the research process:

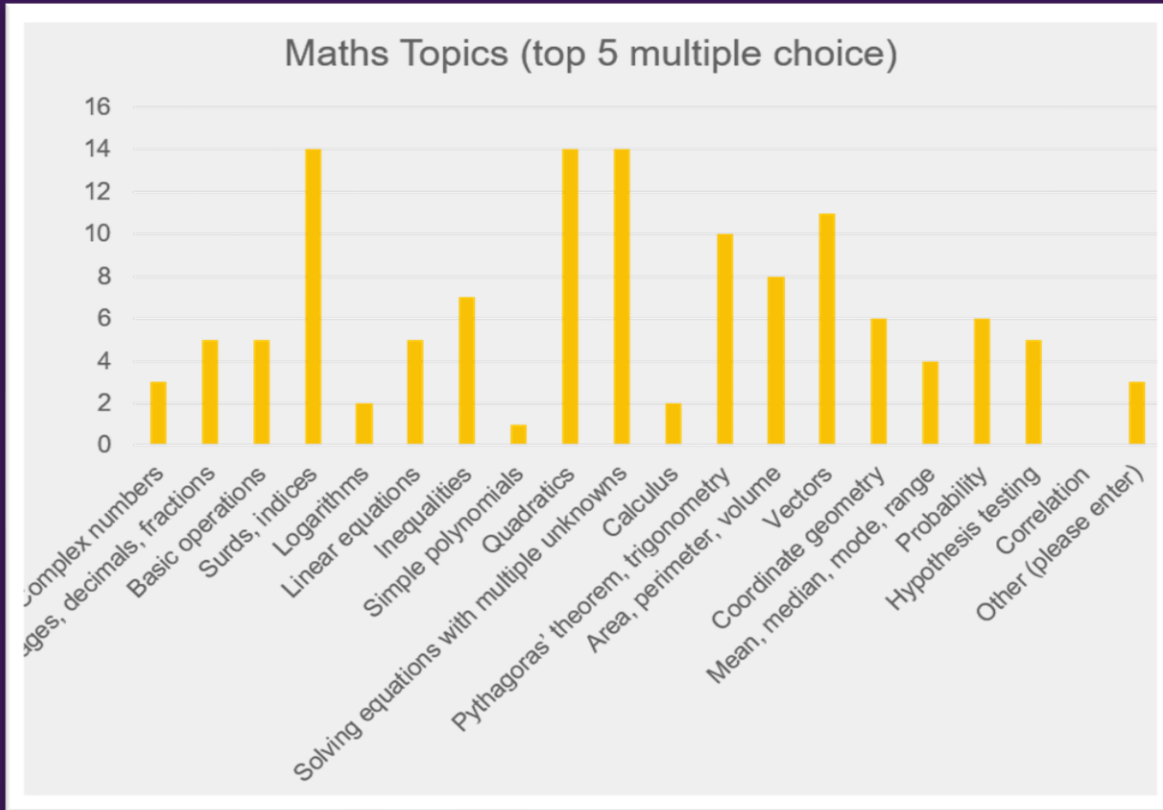
- In-person delivery is more effective than online
- Tutoring is more impactful than mentoring
- Careful selection of maths topics is critical
- Small-group tutoring is the most effective and scalable model
- Middle-attaining students are a key target group
- University students can be highly effective tutors
- High-quality tutor training is essential
- These insights directly informed our evidence-led design choices

What is Accelerate?



- Students complete **pre-test** on 4 selected topics
- Students attend a **launch event** on UCL's Bloomsbury campus
- 12 weeks of **in-person tutoring** at their school
- **Post-test** on 4 selected topics
- Finishes with a **celebration event** on UCL's Bloomsbury Campus
- Students become **Accelerate Graduates** in Year 11

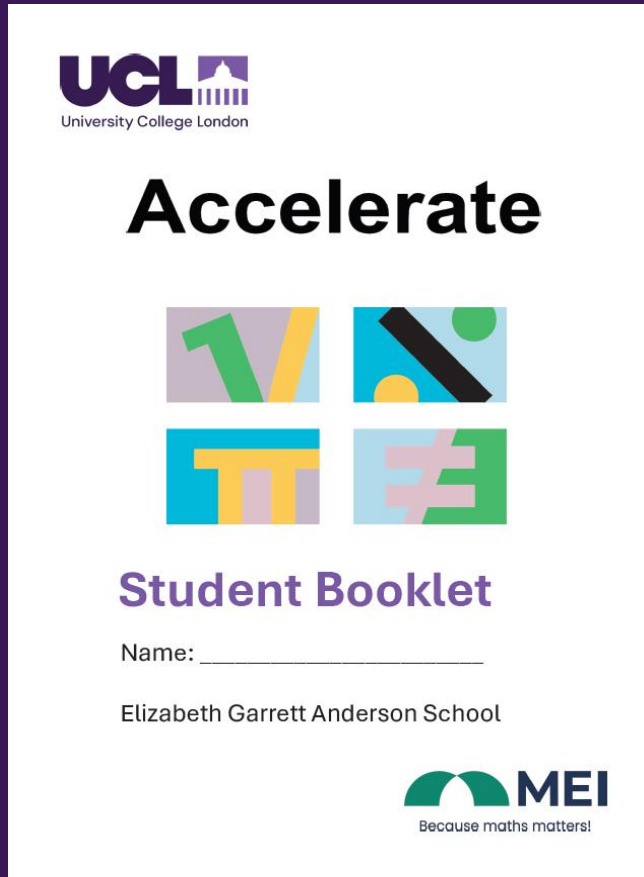
How were the topics selected?



Q: Which of the following topics within the KS4 Maths curriculum do you feel that students struggle most with / could benefit from extra support?

- Teacher's selected multiple maths topics that students find the most difficult
- Focus on "interlinking topics"
- 8 topics were chosen: Bounds, Functions, Graphs, Quadratic Equations, Ratio and Proportion, Sequences, Surds and Trigonometry
- Schools choose 4 out the 8 topics for the 12 weeks of tutoring
- Each topic follows a three-week structure

How were the sessions and resources created?



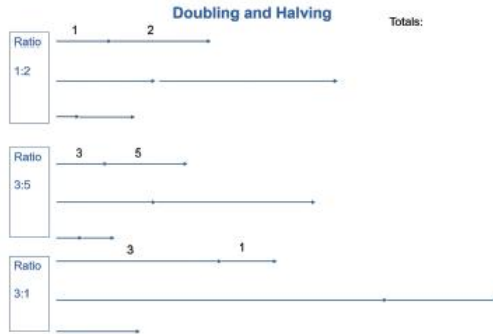
- Teacher recommendations from research:
 - 'I, We, Do' modelling to ensure retention
 - Guiding the thought process of solving a problem
 - Toolkit for answering different types of questions
- MEI as subject experts:
 - Design session plans for tutors
 - Creation of student booklet
 - Stretch and challenge resources
 - Design pre- and post-programme tests
 - Integral platform (Pilot – Online homework – Removal)

Example Topic – Ratio and Proportion



Ratio and Proportion Week 1

Activity 1 – Doubling and Halving



Activity 2 – Times Tables

1	2	3	4	5	6	7	8	9	10	11	12
2	4	6	8	10	12	14	16	18	20	22	24
3	6	9	12	15	18	21	24	27	30	33	36
4	8	12	16	20	24	28	32	36	40	44	48
5	10	15	20	25	30	35	40	45	50	55	60
6	12	18	24	30	36	42	48	54	60	66	72
7	14	21	28	35	42	49	56	63	70	77	84
8	16	24	32	40	48	56	64	72	80	88	96
9	18	27	36	45	54	63	72	81	90	99	108
10	20	30	40	50	60	70	80	90	100	110	120
11	22	33	44	55	66	77	88	99	110	121	132
12	24	36	48	60	72	84	96	108	120	132	144

Activity 3 – Using times tables

21:35 is the same as 3:5

56:32:8 is the same as 7:4:1

Activity 4 – Kennel Question

A kennel feeds pets in proportion to their size.

There are 3 dogs that week that measure nose to tail are 20 cm, 40 cm, and 50 cm.

How would you write that ratio?

If the smallest dog gets 100 g of dog food per meal what should the other two get?



Ratio and Proportion Week 2

	Tutor question, mark scheme and notes	Student mirrored question, mark scheme and reflection notes
Question	AQA November 2021 Higher Tier Paper 2 Q2 A is half of B. Work out the ratio A : B Circle your answer. [1 mark] 1 : 2 2 : 1 1 : 3 3 : 1	AQA June 2019 Higher Tier Paper 2 Q3 2a is five times bigger than b. Circle the ratio a : b [1 mark] 10 : 1 1 : 10 5 : 2 2 : 5
Working		
Notes		
Question	Adapted from various previous exam questions p:q=3:7 and q:r=5:9 find the ratio p:q:r [3 marks]	Mirrored question a:c=3:4 and b:c=2:3 find the ratio a:b:c [3 marks]
Working		
Notes		

Question	Edexcel June 2020 Higher Tier Paper 1 Q 10 Given that $\frac{a}{b} = \frac{2}{5}$ and $\frac{b}{c} = \frac{3}{4}$ find a:b:c [3 marks]	Mirrored question Given that $\frac{x}{y} = \frac{3}{7}$ and $\frac{y}{z} = \frac{5}{6}$, find x:y:z. [3 marks]
Working		
Notes		

Three-week structure:

Week 1: Introducing key vocabulary, examples, formulas, activities and embedding foundational knowledge

Week 2: Mirrored questions. Tutor will model how to answer a question, and their tutees will answer a mirroring question using the same method



Example Topic – Ratio and Proportion

Ratio and Proportion Week 3

First group: 10 marks

Question	AQA June 2023 Higher Tier Paper 2 Q1 Write 30 : 12 in the form $n : 1$ [1 mark]
Working	
Notes	

Question	Edexcel June 2020 Higher Tier Paper 3 Q21a $5c + d = c + 4d$ Find the ratio of $c : d$ [2 marks]
Working	
Notes	

Question	Edexcel November 2021 Higher Tier Paper 3 Q2 Natalie makes potato cakes in a restaurant. She mixes potato, cheese and onion so that weight of potato : weight of cheese : weight of onion = 9 : 2 : 1 Natalie needs to make 6000 g of potato cakes. Cheese costs £2.25 for 175 g. Work out the cost of the cheese needed to make 6000 g of potato cakes. [4 marks]
Working	
Notes	

Ratio and Proportion

Challenge Questions



Problem 1: What are fillings made out of?

Dentists use alloys of mercury with metals such as silver, copper, tin and zinc. This alloy is called Amalgam and is an "excellent and versatile restorative material" used in dentistry for a number of reasons.

In dental amalgam there are

- 3 parts silver to 1 part tin
- 1 part mercury to 5 parts copper
- 3 parts tin to 10 parts copper
- 8 parts zinc to 15 parts copper

For each of the following, write your answer as a ratio using integers (whole numbers) in its simplest form.

What are these ratios?

Mercury : Tin

Mercury : Zinc

Silver : Zinc

Tin : Zinc

What is the ratio Mercury : Silver : Copper : Tin : Zinc ?

Express your answer in its simplest form using integers.

Three-week structure:

Week 3: Exam questions. Students answer questions in 'groups' independently and then discuss their answers with their tutors.

Stretch and challenge resources are available for students to be used at any point in a topic.

Who are our participants?



- Participants are selected using the following criteria:
 - Working at grade of 4/5 in maths
 - Sitting the higher tier GCSE maths paper
 - Eligible for Pupil Premium/FSM
- Schools nominate everyone in year group (Year 10) who is eligible
- Parents of nominated students receive consent form
- Randomisation process puts students into a participant or control group

Reflections from Accelerate participants

"I doubt myself too much"

"What I have learnt from the programme is critical thinking and asking for help more on topics I find difficult"

"I like teaching my friends what I have learnt"

"I am most proud that I can now do specific maths topics that I used to struggle with"

"I am most proud of how far I've come during this programme"

"I can use the solving methods and apply it to the questions in my assessments"

"I'm better at maths that I thought"

"I am most proud of completing the course"

"In the future, I can use the resilience I've built up throughout the programme"

Who are our Tutors?



- Tutors are current UCL undergraduate or postgraduate students
- Training includes:
 - The Brilliant Club (tutoring skills) and MEI (resources)
 - Attending a lesson observation at their school
 - Safeguarding
- Development opportunities: senior tutor, progression into school-based roles

Reflections from Accelerate tutors

"It's been amazing – I really loved interacting with the students and honestly it's made me love maths even more."

"It's been incredible! I've thoroughly enjoyed every session and most often, tutoring at the school has been the highlight of my week!"

"This experience has strengthened my ability to communicate ideas clearly, adapt explanations to different learning styles, and build students confidence over time. Working with students from a range of backgrounds has taught me the importance of encouragement, adaptability, and creating a supportive learning environment where students feel comfortable asking questions and making mistakes."

" Taking on a more senior role with additional responsibilities also taught me a great deal about leadership, organisation, and helping others. Seeing students grow in confidence and achieve their goals has been one of the most rewarding aspects of the experience."

Schools: who are they & how do we work with them?



Who are they?

- 5 partner schools across London
- High-priority schools
- Above national average percentage of FSM students

How do we work with them?

- Adapting comms with schools
- Strong working relationships
- Teacher feedback days
- School leads using programme as a development opportunity

Evaluation: How do we know this works?



- Accelerate was designed with a randomised control trial (RCT)
- Attainment was measured alongside intermediate outcomes
- Post-test results demonstrated a statistically significant improvement in maths attainment
- Evidence also highlighted the importance of intermediate factors:
 - Increased confidence
 - Improved engagement
 - Greater subject enjoyment

Evaluation Challenges



- RCTs provide robust evidence but introduce significant operational challenges
- Key constraints include:
 - the need for control groups, increasing scale and complexity
 - Additional workload for schools
 - Parental consent processes affecting recruitment from target groups
- These factors can limit participation, particularly among target groups
- Evaluation design therefore has direct implications for who the programme is for, and who can access it

Next Steps for Accelerate 26/27



- Expansion of the programme from 5 to 7 schools
- Widen eligibility criteria
- Continue with RCT to establish proof of concept
- Review of tutor training
- Collate and review student & teacher feedback from the 25/26 programme
- Review resources with MEI

Any Questions