The Maths Bridging Initiative:

An Institutional Transition Support Programme

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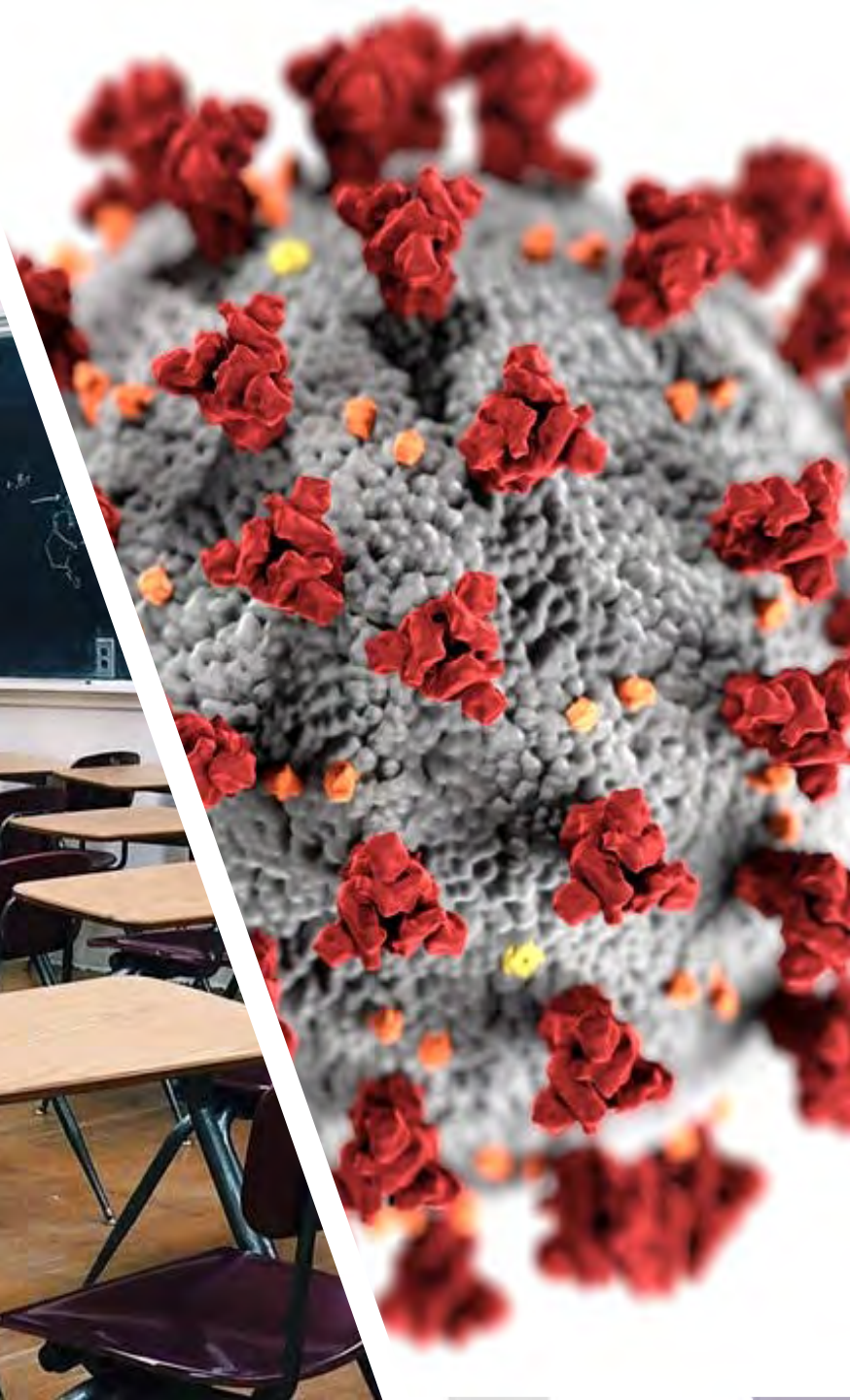



A COVID STORY

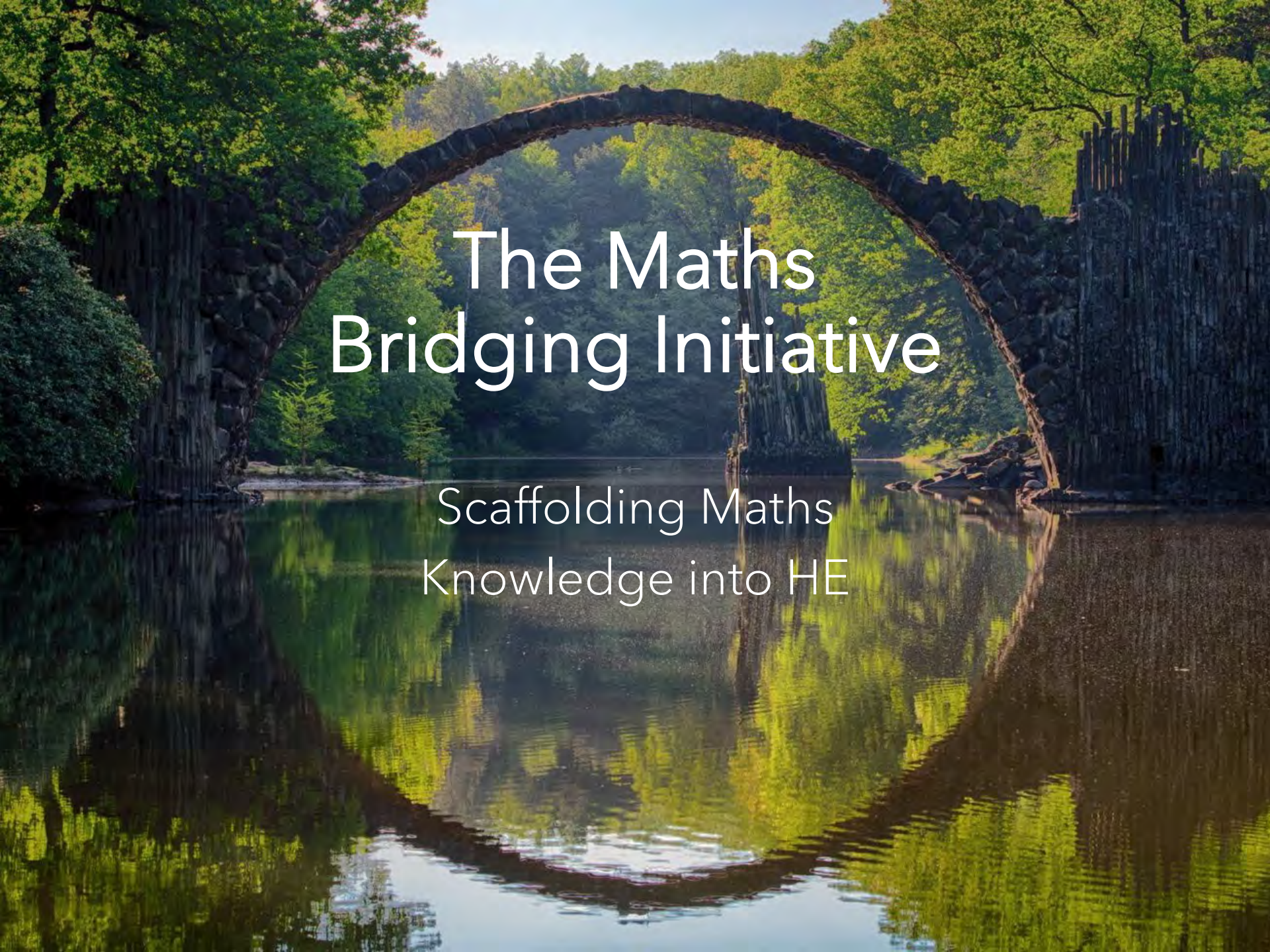
COVID & A-Level
what we knew…

The Full A-Level Maths Curriculum Was Not Delivered

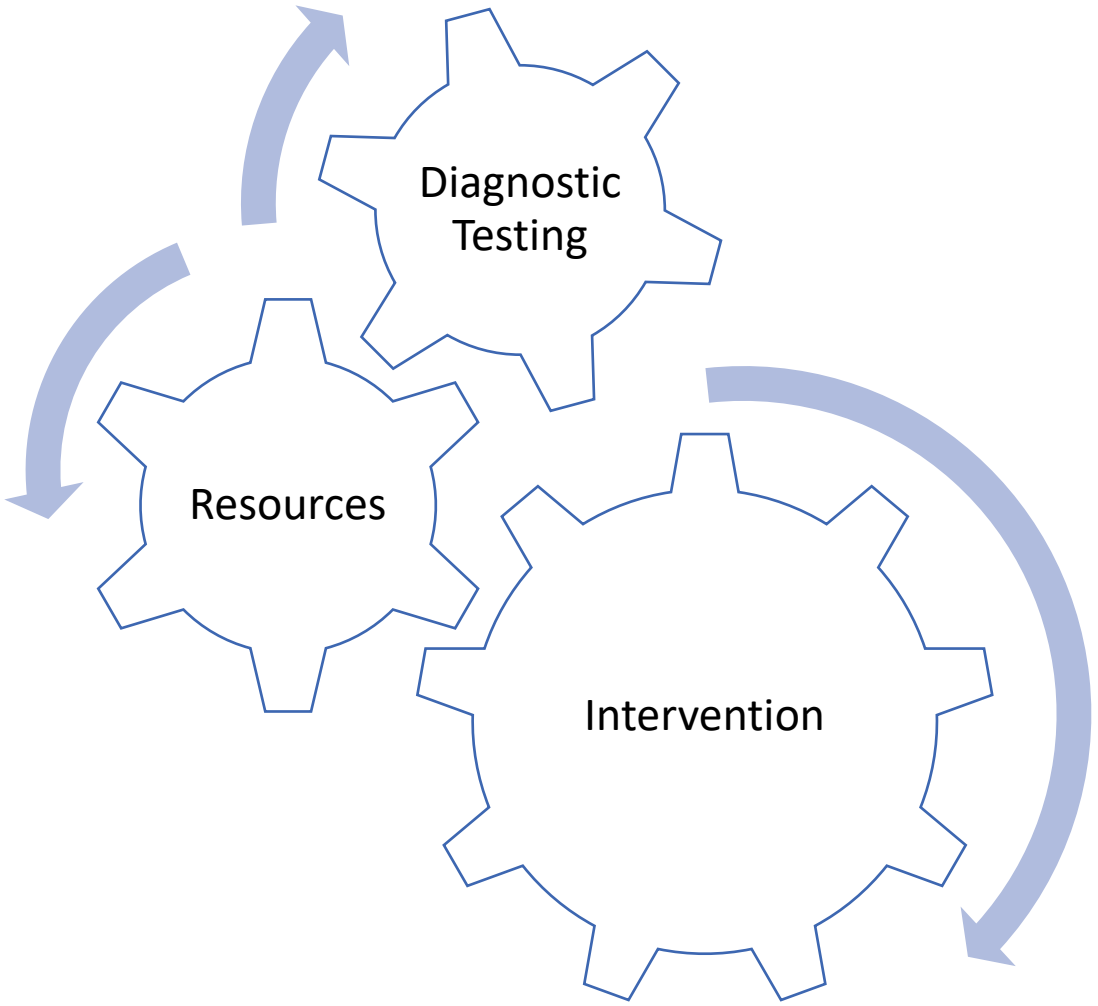
No Formal Exams for Two Years

Curriculum Delivered Varied by School

102 Programmes at QUB Required A-Level Maths


The Maths
Bridging Initiative
Scaffolding Maths
Knowledge into HE

Not 'Just' Another Intervention



Designing the Diagnostic Tests

Sourcing the Data for Bespoke Diagnostic Testing

How important is it for the students on your programme to have knowledge of the following A Level Pure Mathematics Algebra and Functions topics?

	Not Needed	Useful	Essential
1.1 Laws of indices and surds	○	○	○
1.2 Solving quadratics, simultaneous equations and linear and quadratic inequalities	○	○	○

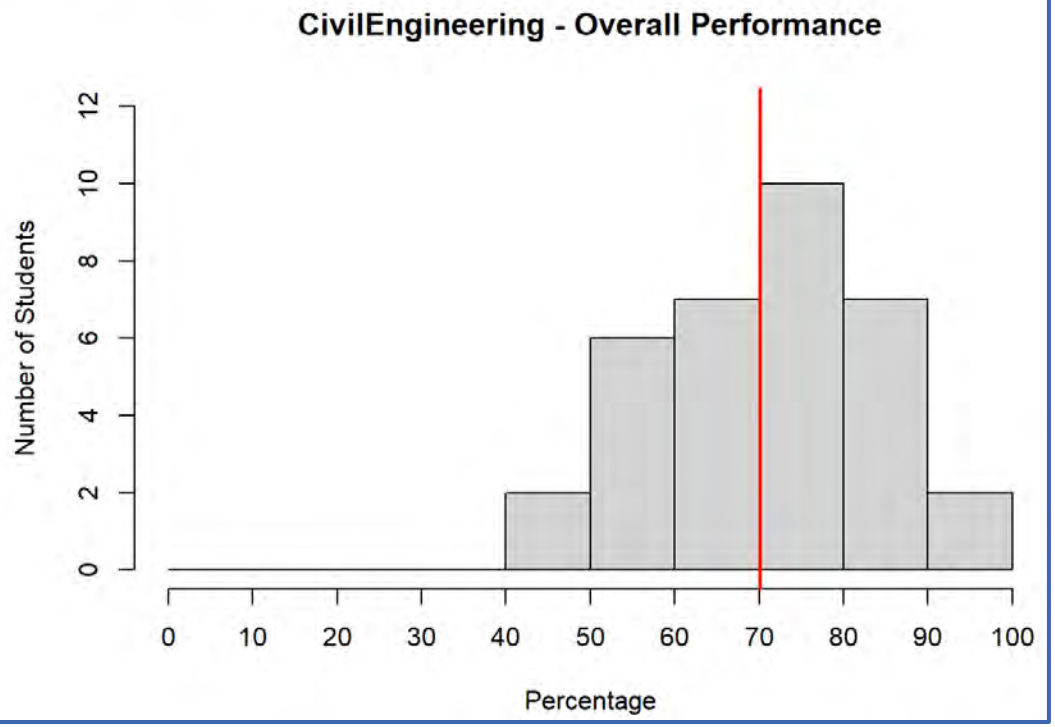
Enabling a Data Driven Approach

Executive Summary

Number of students who have completed: 34.

Average score: 70.17%

Histogram where the red line indicates the average.



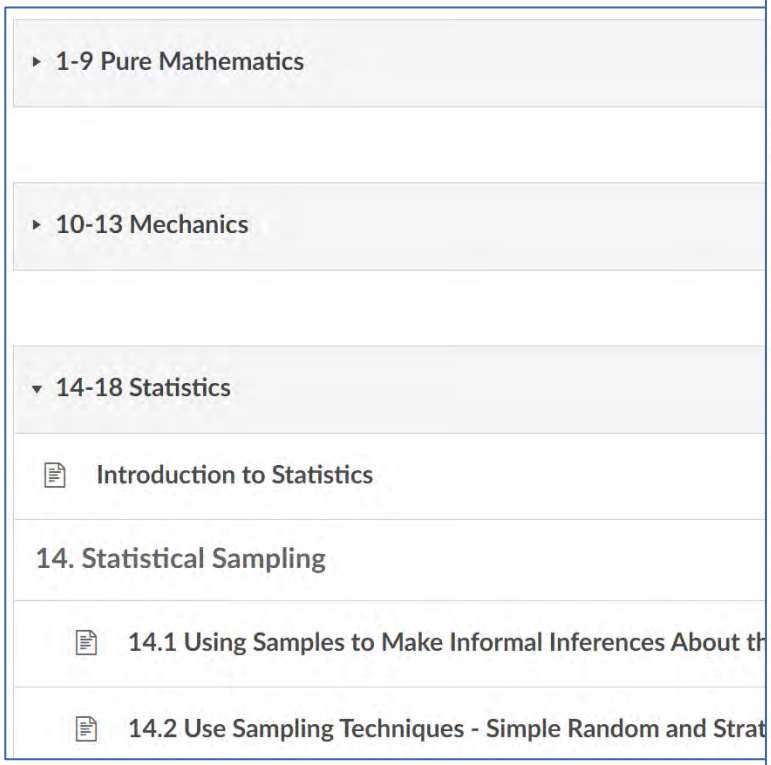
Enabling a Data Driven Approach

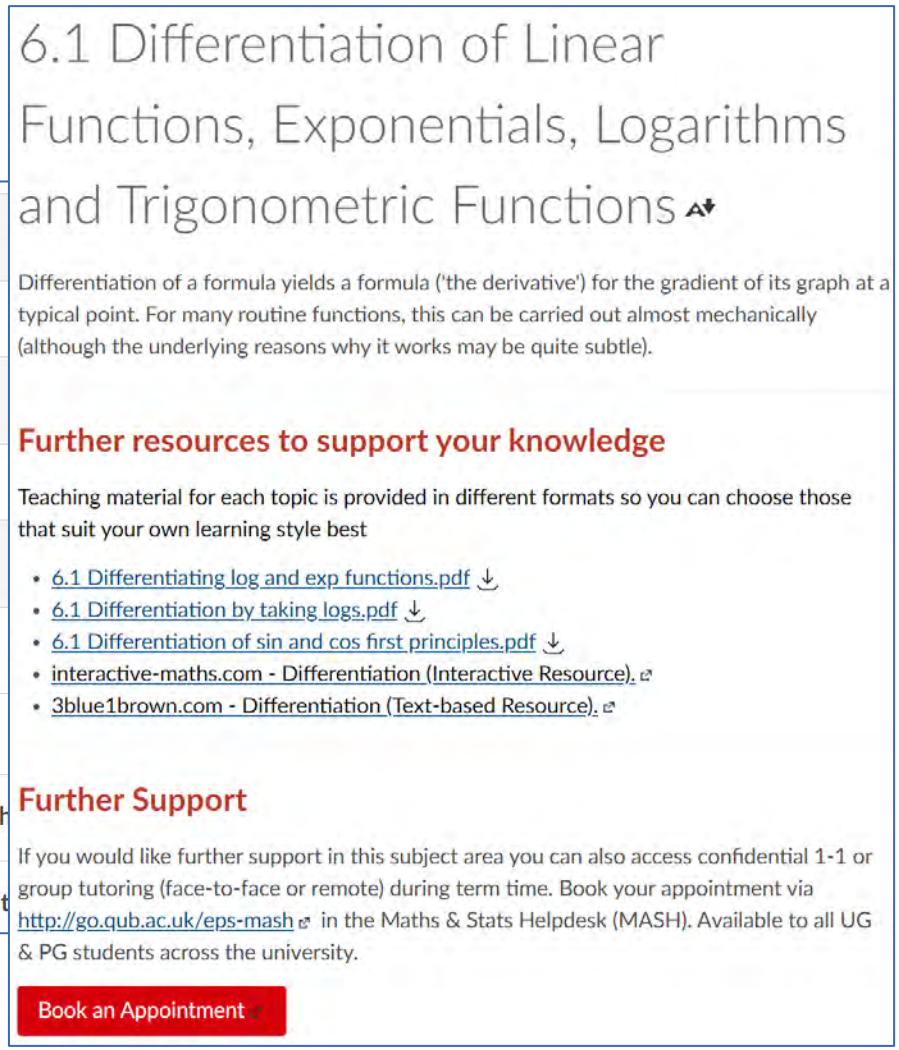
Schools Receive Detailed Reports on A-Level Bottleneck Areas

7.3 Integration by parts	76.47	23.53	100
7.3 Integration by substitution	73.53	26.47	100
7.3 Integration using partial fractions	**32.35**	**67.65**	**100**
10.2 Q1 Formulae for constant acceleration for motion in a straight line	82.35	17.65	100
10.2 Q2 Formulae for constant acceleration for motion in a straight line	91.18	8.82	100
10.4 Calculus in kinematics in two dimensions and motion in a straight line	**8.82**	**91.18**	**100**
11.2 Resolve forces in two dimensions	73.53	26.47	100
11.5 Weight and motion in a straight line under gravity	73.53	26.47	100
11.8 Solve problems involving equilibrium of forces on a particle, motion of a body on a rough surface and limiting frictions and statics	**50.00**	**50.00**	**100**

Student Signposted To Resources Based on Diagnostic Results

Resources


1-9 Pure Mathematics
10-13 Mechanics
14-18 Statistics
Introduction to Statistics
14. Statistical Sampling
14.1 Using Samples to Make Informal Inferences About th
14.2 Use Sampling Techniques - Simple Random and Strat


6.1 Differentiation of Linear Functions, Exponentials, Logarithms and Trigonometric Functions
Differentiation of a formula yields a formula ('the derivative') for the gradient of its graph at a typical point. For many routine functions, this can be carried out almost mechanically (although the underlying reasons why it works may be quite subtle).
Further resources to support your knowledge
Teaching material for each topic is provided in different formats so you can choose those that suit your own learning style best
6.1 Differentiating log and exp functions.pdf
6.1 Differentiation by taking logs.pdf
6.1 Differentiation of sin and cos first principles.pdf
interactive-maths.com - Differentiation (Interactive Resource).
3blue1brown.com - Differentiation (Text-based Resource).
Further Support
If you would like further support in this subject area you can also access confidential 1-1 or group tutoring (face-to-face or remote) during term time. Book your appointment via http://go.qub.ac.uk/eps-mash in the Maths & Stats Helpdesk (MASH). Available to all UG & PG students across the university.
Book an Appointment

Interventions

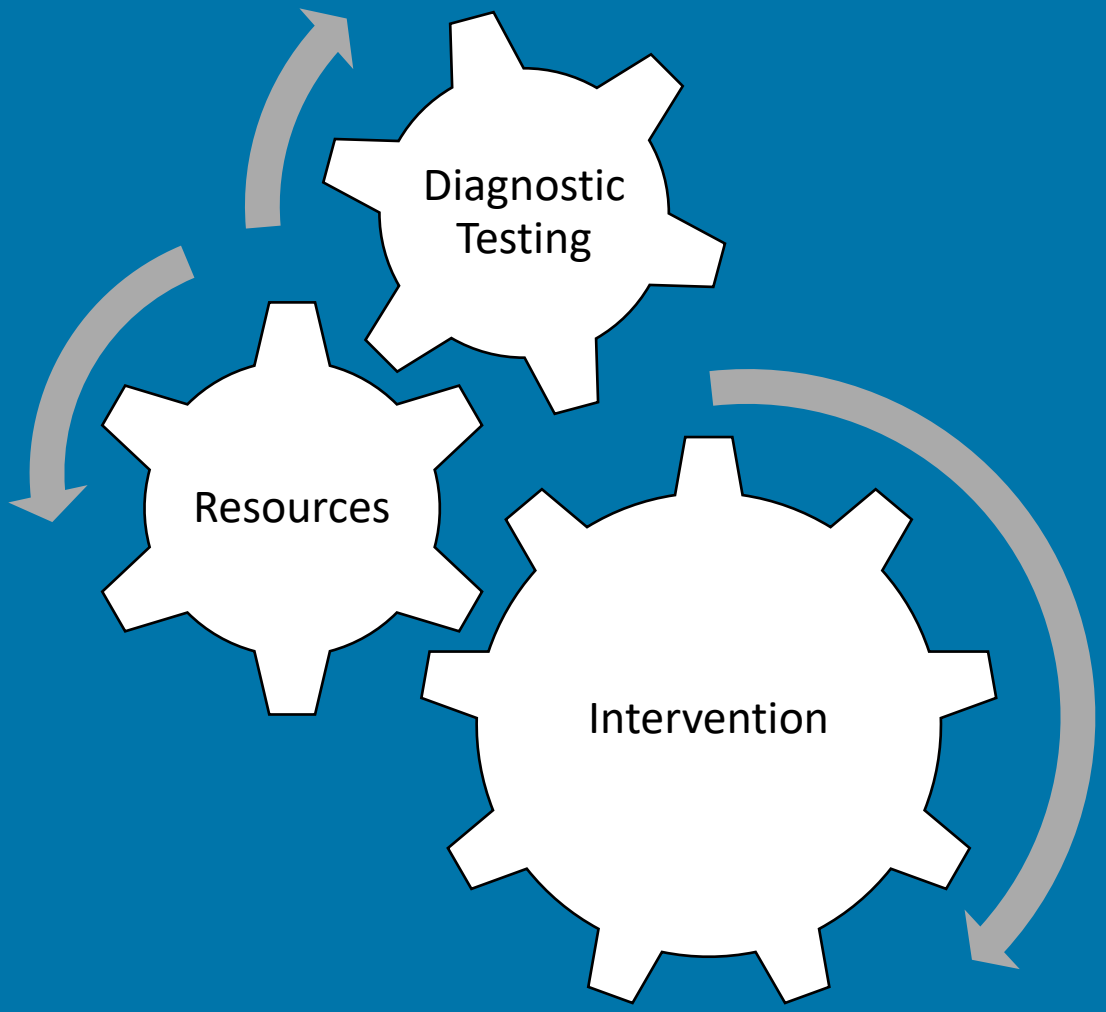
Upcoming | Past

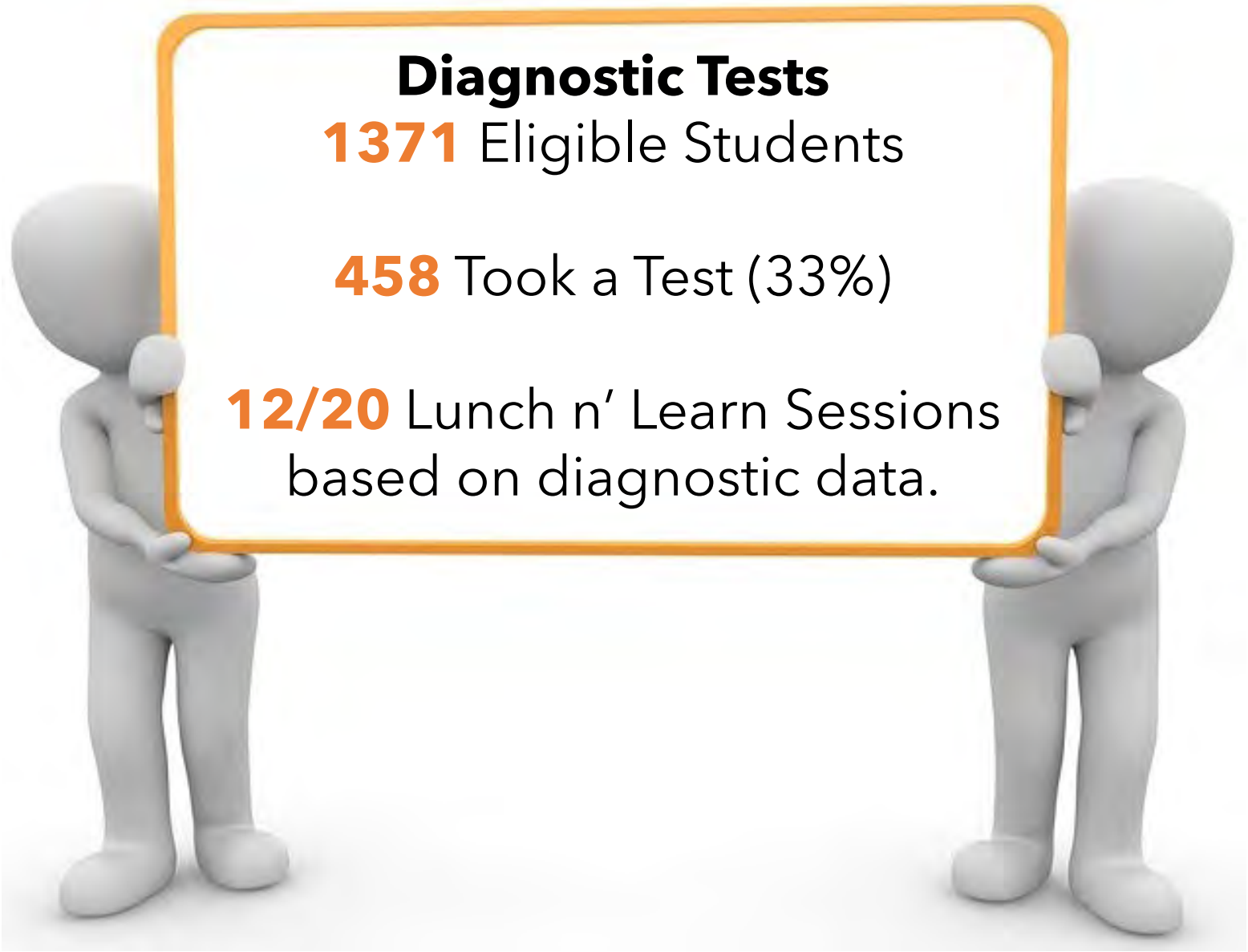
Date	Time	Event	Description	Venue	Actions
Tuesday 19th October 2021	1pm - 1.45pm	Lunch n Learn – Integration (1)	First year QUB students are welcome to come along to this event and learn more about integration as the reverse of differentiation: standard integrals and how to extend their use by "guess and check and modify" . Integration by substitution -- changing the variable (how and why). Lunch is provided so booking is essential.	Medical Biology Centre, South Lecture Theatre	More Info Register
Wednesday 20th October 2021	1pm - 1.45pm	Lunch n Learn – Integration (2)	1st year QUB students can come along and discover more techniques and examples of integration, aiming to include integration by parts, further "guessing and checking", definite integrals, areas, volumes etc. Lunch is provided so booking is essential.	Mathematics & Physics Teaching Centre, Room OG/006	More Info Register
			This workshop, designed specifically to support 1st yer UG students across QUB, will quickly review the derivatives of around a dozen standard functions,		

Data Driven Interventions

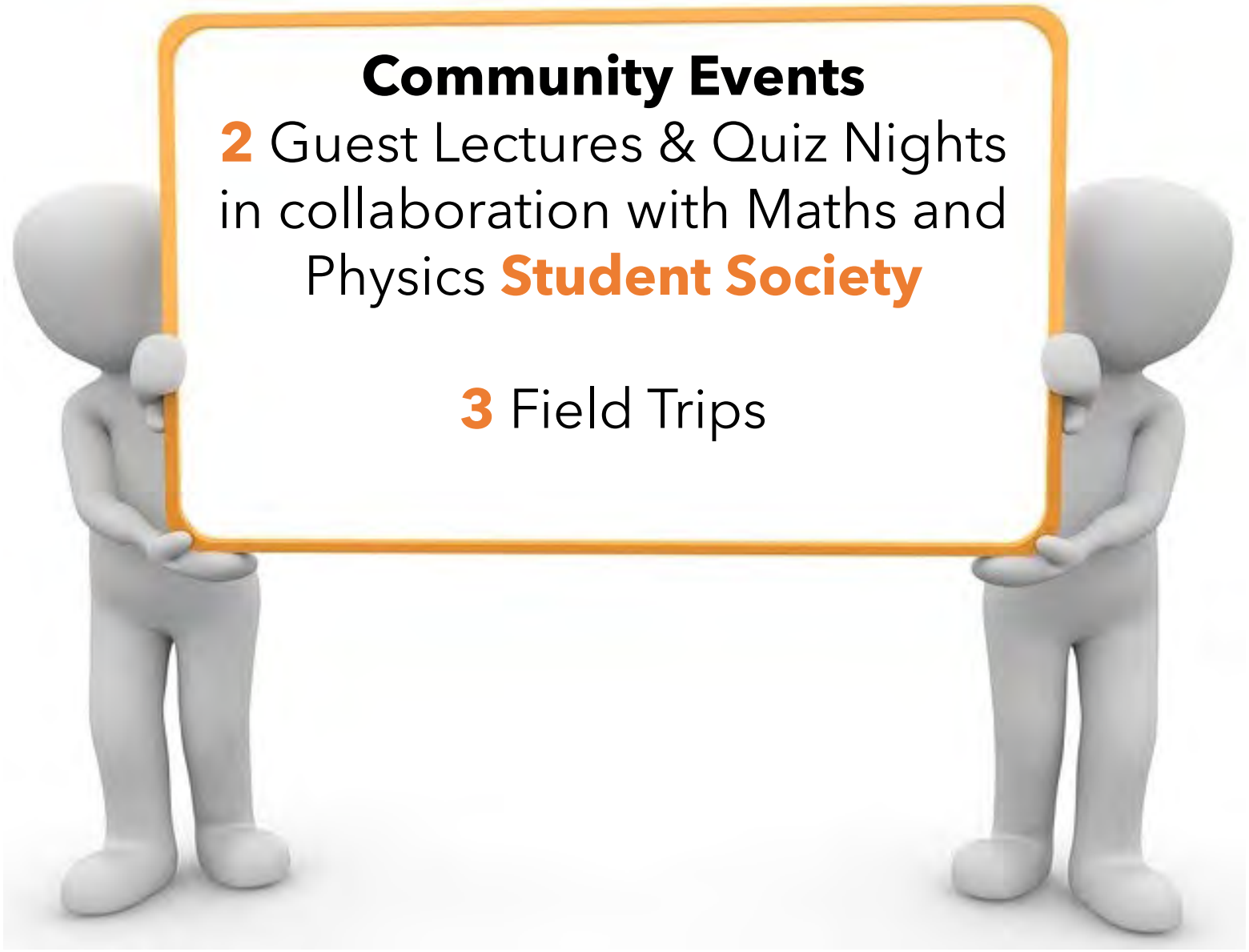
Use Diagnostic Data	Inform Core Teaching	Proactive Student Engagement
Discipline Specific Interventions	Grow Learning Communities	Identify Areas of Non-Engagement

Outcomes **(2021/22)**




Diagnostic Tests
1371 Eligible Students
458 Took a Test (33%)
12/20 Lunch n' Learn Sessions based on diagnostic data.


Education Events
20 Lunch n' Learn Sessions
8 Exam Bootcamps
15 Online and Person Workshops


Community Events
2 Guest Lectures & Quiz Nights in collaboration with Maths and Physics Student Society
3 Field Trips

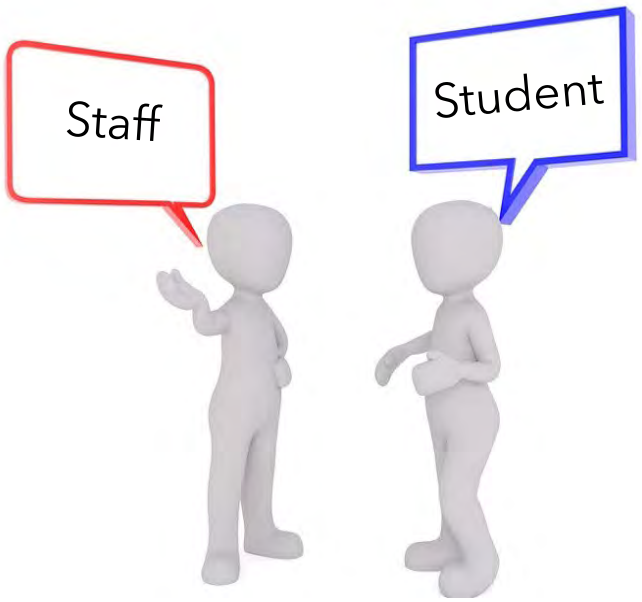
“Thanks for supporting and helping our students”

98%

of students would recommend Lunch n Learn sessions to others

"Very helpful and informative”

“Thank you for including us and for the resources you are providing for our students”



"Friendly lecturer, good explanations"

“I really appreciated the effort by you and your team”

"Very easy to follow explanations, definitely gained out of this"

Reflections on 2021-22

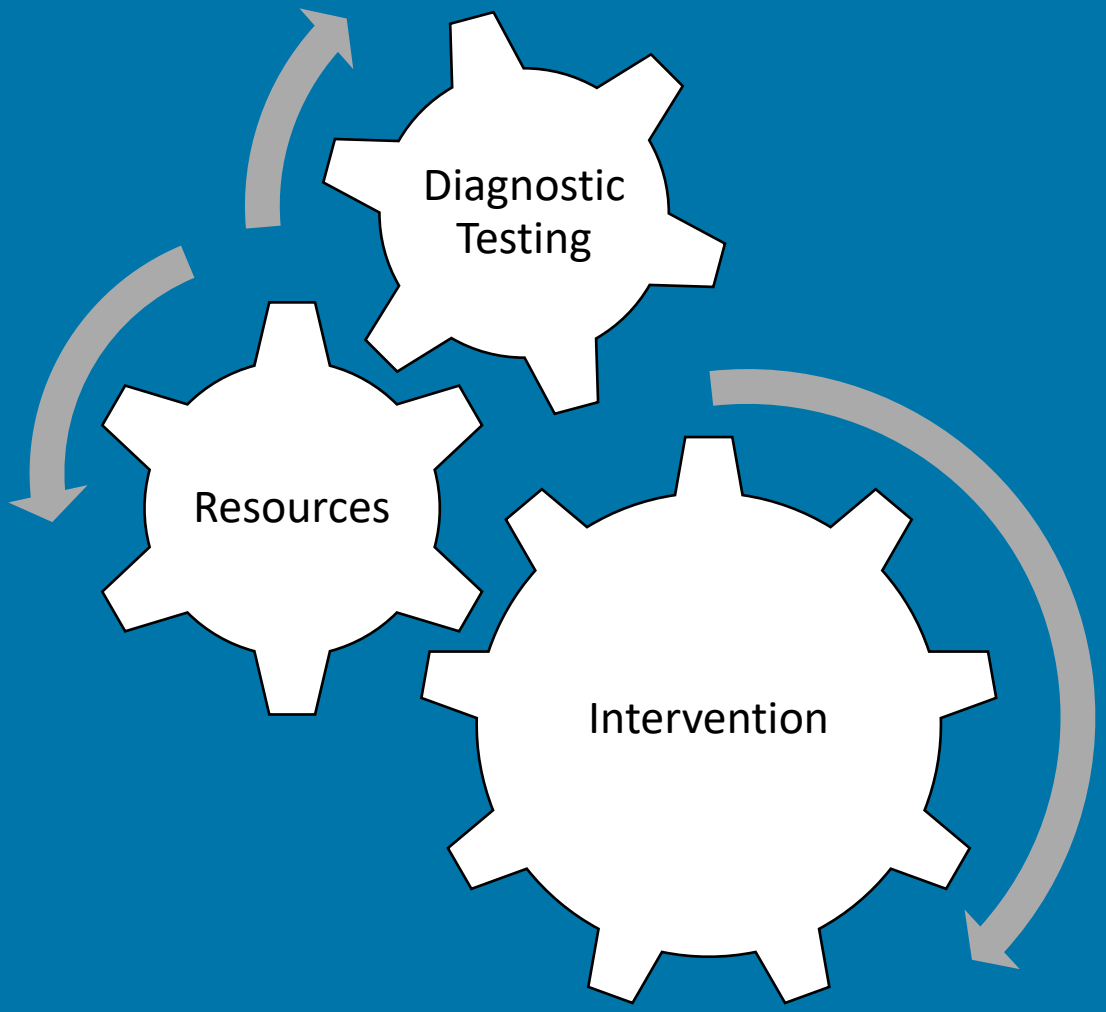
Data Driven Interventions were effective.

Poor engagement can be a problem.

GCSE Level Maths often more beneficial.

Scheme will run again in 2022/23

How did it go? **(2022/23)**



Opening Thoughts

Continued the Data Driven Approach

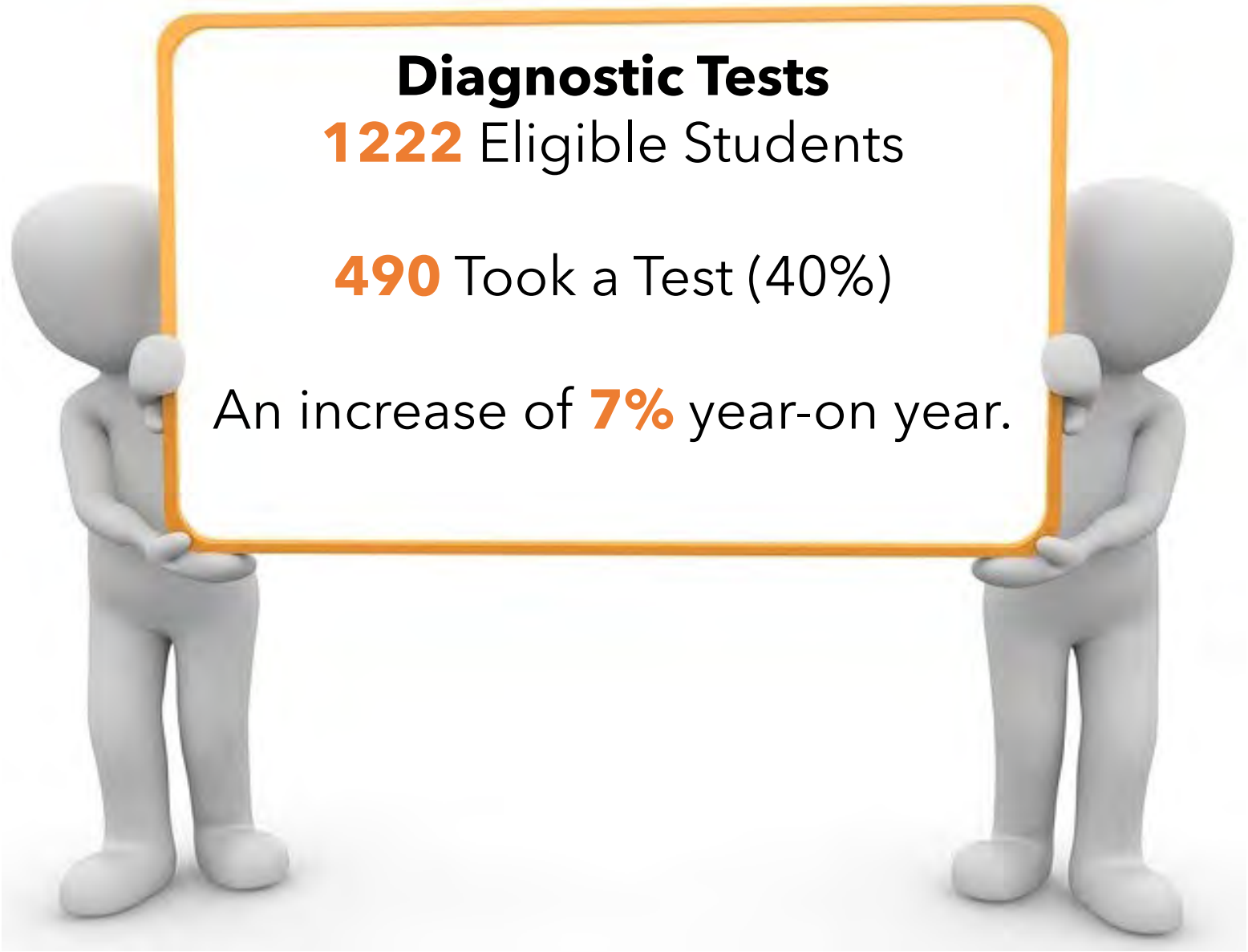
- Bespoke Diagnostic Tests
- School-Specific Events
- Development of Resources

Deepened Integration with QUB Curricula

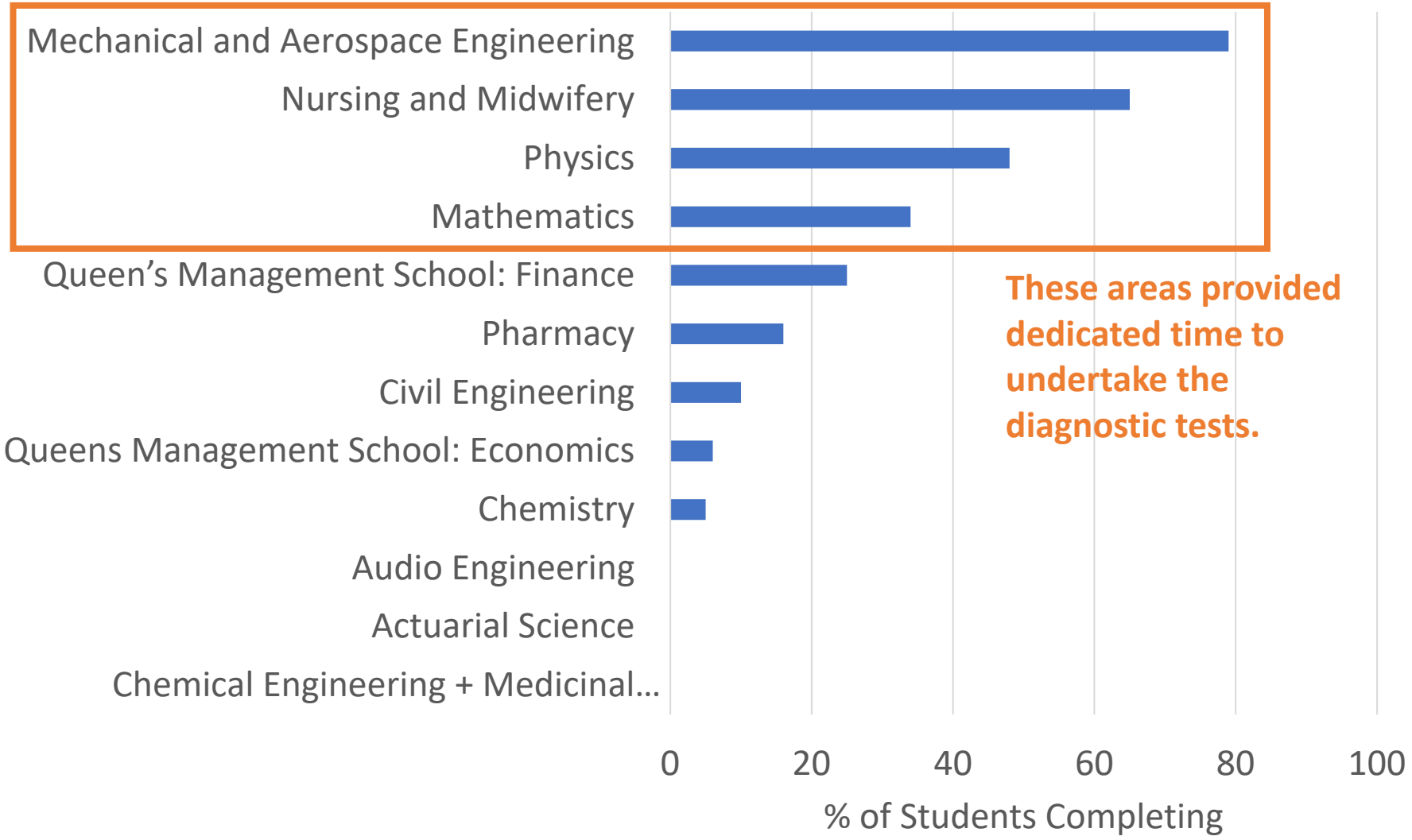
- Greater focus on Schools actively requesting support
- Some areas built in class time for MBI activity.

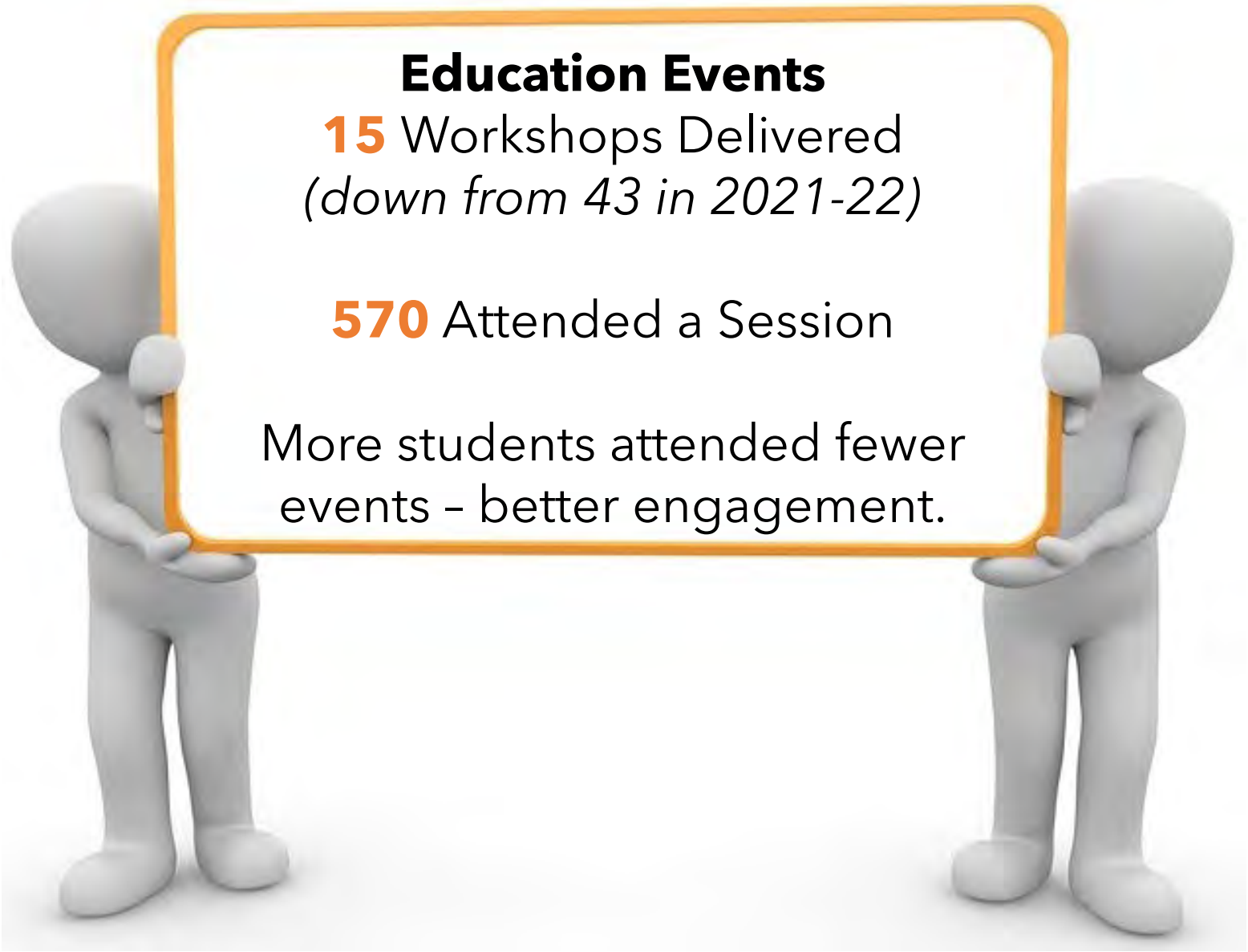
Managed Reduced Funding

- Now internally funded
- From ~£120k to ~£18k
- Reduced social events


Diagnostic Tests
1222 Eligible Students
490 Took a Test (40%)
An increase of 7% year-on year.

% of Students Undertaking Diagnostic Test by Academic Area




Education Events
15 Workshops Delivered
(down from 43 in 2021-22)
570 Attended a Session
More students attended fewer events – better engagement.

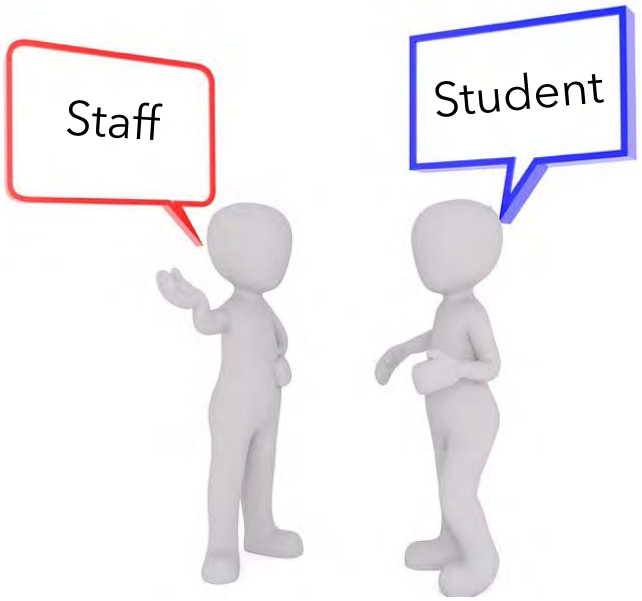
“Great to see the very positive feedback from the students – excellent” (Physics)

98.5%

of students would recommend Lunch n Learn sessions to others

"Brilliant. Really engaging and helpful"

All but 1 student who attended the workshop passed. (Nursing and Midwifery)



"Friendly lecturer, good explanations"

Students requested that the diagnostic tests be made available to all students (Maths)

Consistent with 2021-22

“Helped me understand how to multiply and divide by decimal numbers”

The Bottom Line

Diagnostic tests identify individual learner needs.	Programme teams can adjust curricula based on need.	Enables reflection and targeted study by students.
Fewer, but more bespoke activities can boost engagement.	Students may perceive greater value in targeted activities.	Staff more likely to encourage participation.
The Maths Bridging Initiative Works	Enhances student attainment by mitigating knowledge gaps,	Becoming an established institutional support structure.

QAA Scotland

Enhancement Themes

Scottish Funding Council
Comhairle Maoineachaidh na h-Alba

Thank you