

[core:maths]

A NEW QUALIFICATION FOR WORK, STUDY & LIFE



Getting started with Core Maths

MA Conference
April 2016



The case for Core Maths

- Context for post-16 Level 3 mathematics provision
- Briefing Sheet
- Presentation for Senior leaders

Getting started

- A distinctive approach
- Case Studies
- Resources

Mathematics: a national priority



- 'we are going to look at teaching maths to 18 for all pupils'
- George Osborne 16/3/16
- The government will:
- ask Professor Sir Adrian Smith to review the case for how to improve the study of maths from 16 to 18, to ensure the future workforce is skilled and competitive, including looking at the case and feasibility for more or all students continuing to study maths to 18, in the longer-term. The review will report during 2016

Mathematics: a national priority



- *'... we should set a new goal for the education system so that within a decade the vast majority of pupils are studying maths right through to the age of 18.'*
-
- Michael Gove June 2011

Maths in the news

I might be persuaded, but only if it's applied, not pure, and 'mathematics' is a synonym for 'useful stuff you can apply in real life, even when you don't work at the Large Hadron Collider'

Judith Woods, Daily Telegraph 18/3/16

Force kids to do maths .. Even if they hate it. The argument against compulsory maths doesn't add up.

I'm glad the next generation won't be free to make the same mistake and throw away this crucial skill just before they grasp what it's really about

Hannah Fearn, Independent 18/3/16

A political priority

"Core Maths qualifications are backed by employers and help students to address the practical problems they may encounter in the world of work.

...

I am urging all sixth forms and further education colleges in the East Midlands to make this new practical maths qualification available to their students."

Rt Hon Nicky Morgan, MP for Loughborough
and Secretary of State for Education
18/3/16



A teacher's perspective

'Being able to help at home with finance is a massive step forward for these students.....I had a mum at parents evening last week who came and said "thank you, this is the best course that any of my children has ever done. We've changed so much in our household, we now understand why we shouldn't use the electricity key but go on to direct debit, so we're saving money". It's (Core Maths) changing their lives'.

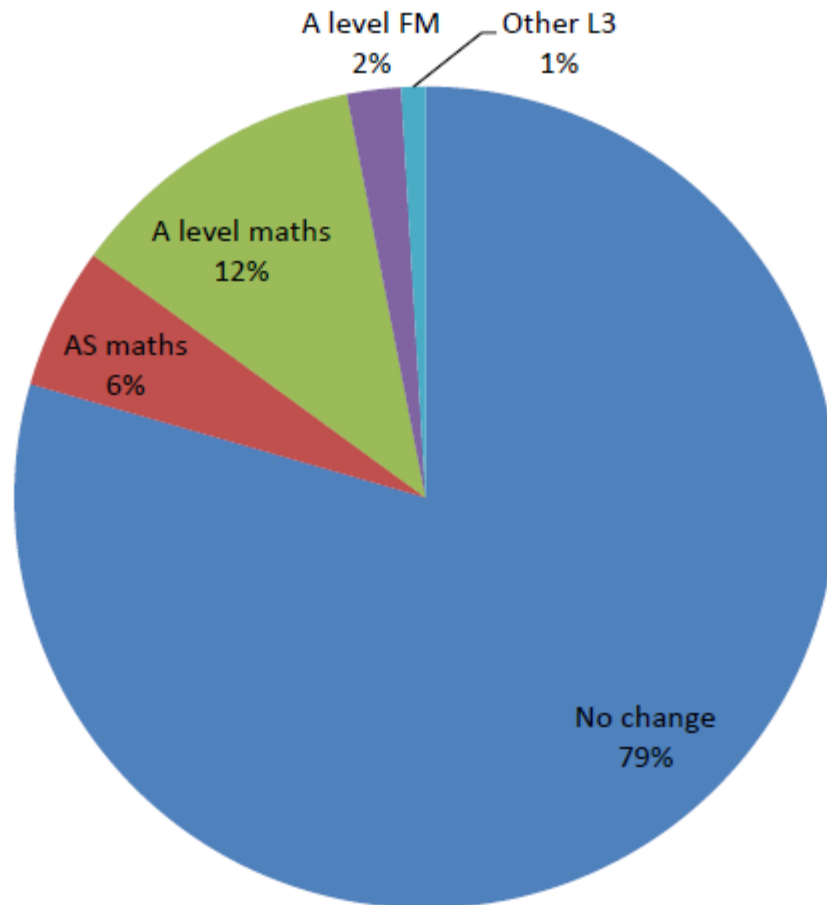
Core Maths Teacher at Newham Sixth-Form College (NewVIc)



[c:m]

**Context for post-16 Level 3
mathematics provision**

What have A*-C GCSE maths students achieved by age 18? (2011 GCSE cohort)



Raising participation

Sources: DfE analysis of pupil-level data



Challenges in post-16 maths

Many students without maths to 18 are not equipped for higher education study, and some with A level maths.

- 330,000 students start courses each year which require advanced (post-GCSE) maths, but over 200,000 of them will not have studied beyond GCSE (ACME, *Mathematical Needs*)
- ***“Many undergraduate students are surprised at the amount of mathematical content in their degree programmes and some struggle to cope with this content..”***



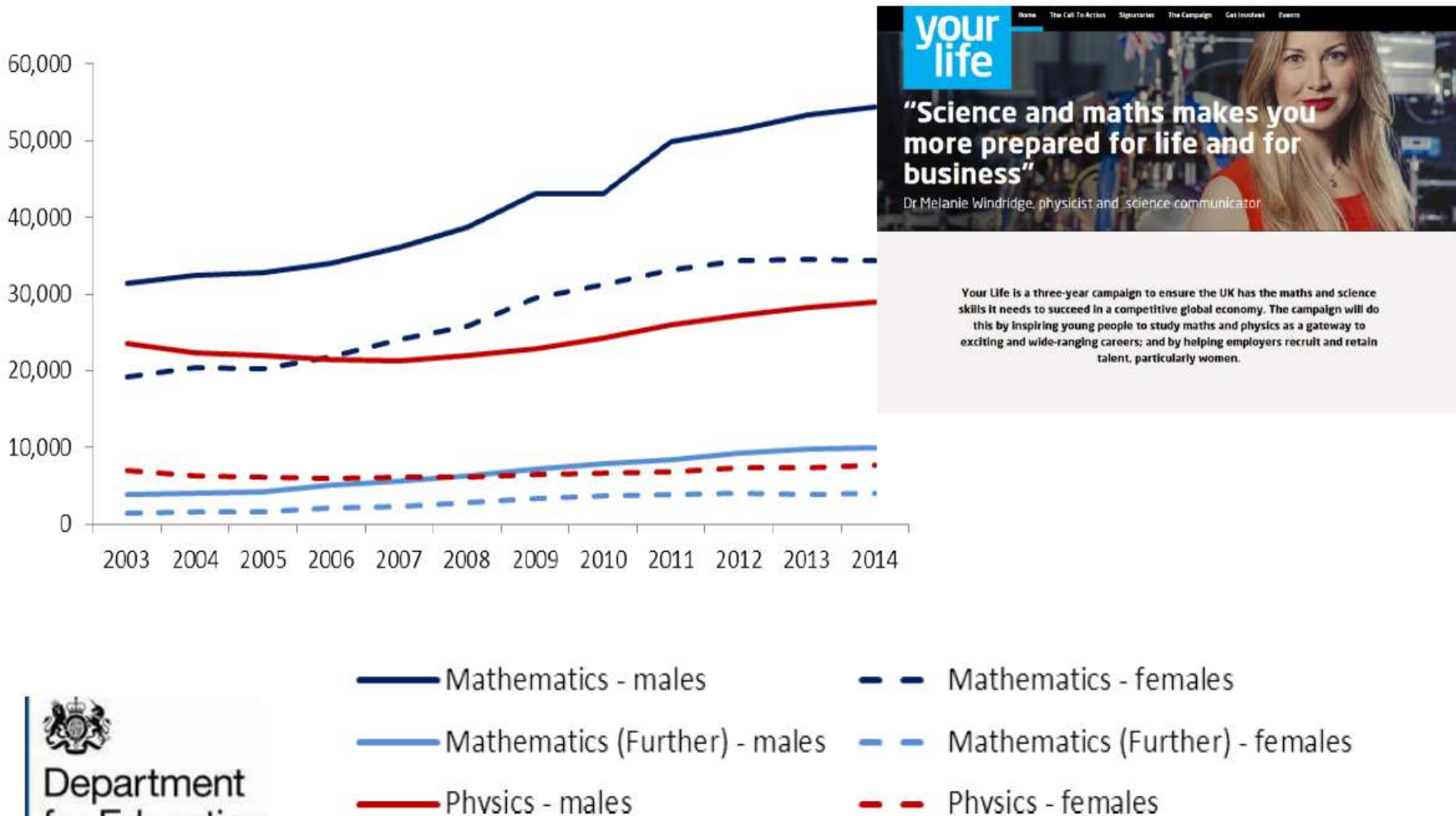
Department
for Education

(Higher Education Academy,
Mathematical Transitions)



Challenges in post-16 maths

A level entries in maths, further maths, and physics, by gender over time:



Department
for Education

Key reforms

- Changes to the mathematics GCSE to strengthen essential skills in numeracy and stretch the most able.
- Introduction of level three 'Core Maths' qualifications for 16-18 year olds with a good pass at GCSE at age 16.
- A "condition of funding" for 16 to 18-year-olds without at least grade C at GCSE to continue studying maths (and English).
- A level maths and further maths content significantly redesigned for 2017.

A level Maths and Further Maths (from 2017)

Key aims:

- Better support transition to mathematical study at university.
- University role in content design - 'ALCAB', chaired by Professor Richard Craster, Imperial College London.

Key changes:

A level maths

- Specified in more detail to clarify requirements.
- 100% prescribed, giving universities confidence about the maths that undergraduates have studied.
- Compulsory applied content in statistics and mechanics and removal of decision maths.
- An emphasis on problem-solving, mathematical communication, and modelling.

A level further maths

- Common pure core - 50% of overall content, allowing scope for applied options such as discrete maths.



Common aims

- raising participation in Level 3 mathematics post-16
- supporting improvement in Level 3 mathematics teaching
- increasing the numbers of schools and colleges able to offer a viable Level 3 mathematics curriculum, including Further Mathematics and Core Maths
- raising girls' participation in Level 3 mathematics
- improving the preparation of students for the mathematical and statistical aspects of higher education or vocational training

[core:maths]

A NEW QUALIFICATION FOR WORK, STUDY & LIFE



Why Core Maths ?

An Introduction for School and College Leaders

Aims

- To explain the rationale for Core Maths in the broader educational and cultural context
- To explain the benefits of incorporating Core Maths in your post-16 curriculum
- To identify sources of practical guidance about implementing and managing Core Maths

Why this Meeting?

- We are proposing a major change to the curriculum – it is important that everyone has some focused time to look at the rationale and implications of introducing Core Maths.
- We want the whole leadership team to have a common understanding of the role and importance of Core Maths.

Reforming Accountability: DfE

Additional Performance Measures

- 'The government has set the ambition that by 2020 the vast majority of young people continue to study maths to age 18. For students who have already gained a good pass at GCSE, we will introduce an additional measure (in 2017) showing the percentage who achieve an approved level 3 maths qualification, which includes new Core Maths qualifications to be introduced for first teaching in September 2015.'

Reforming the accountability system for 16-19 providers: DfE, 2014

The Maths Gap

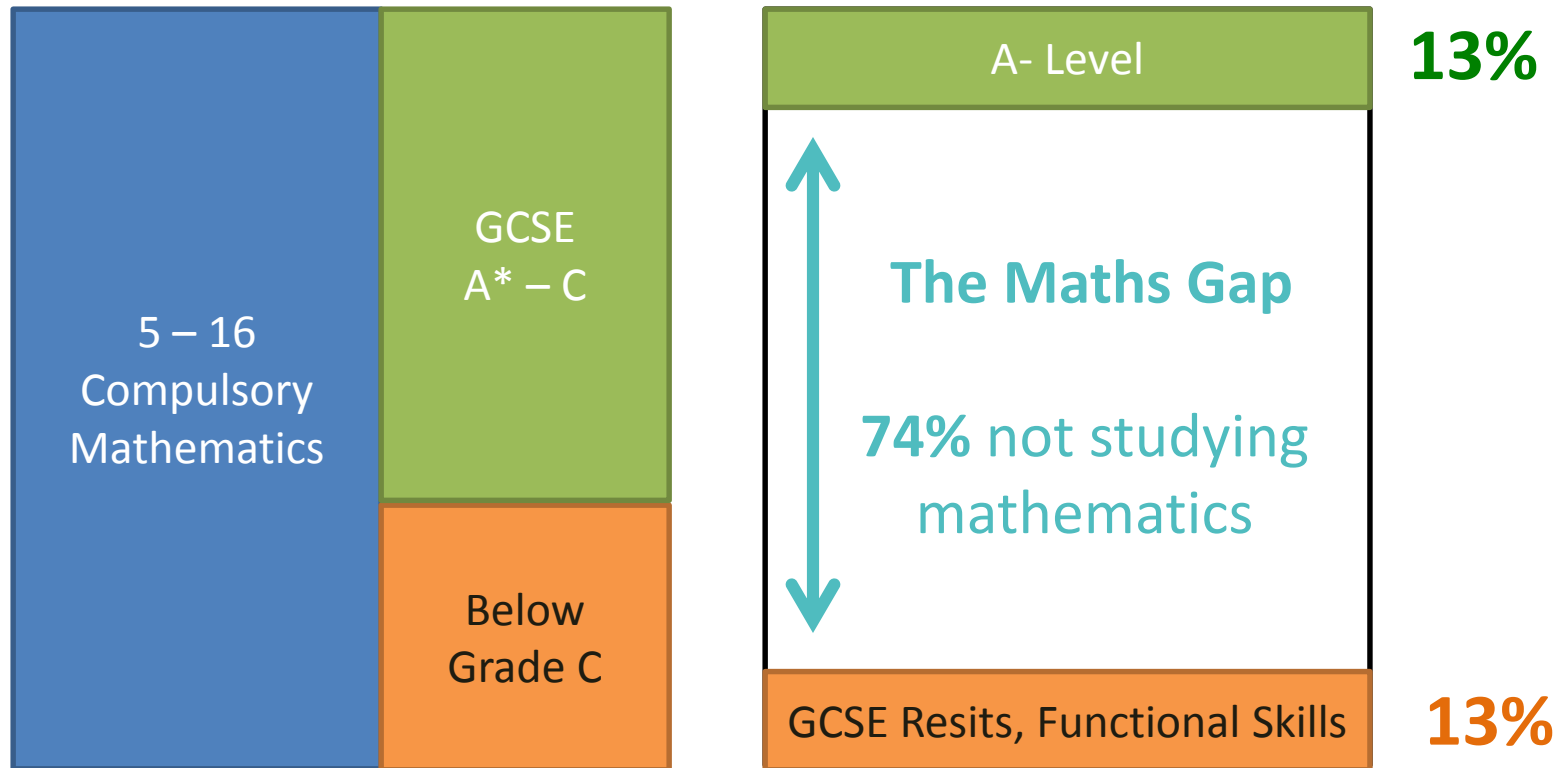
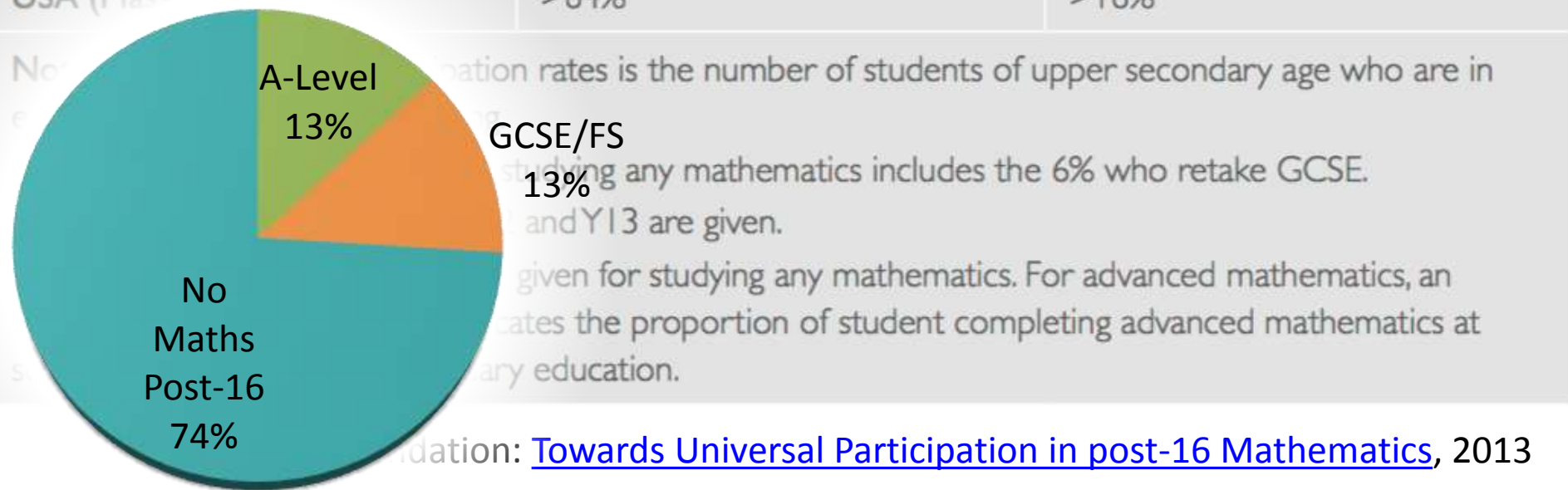
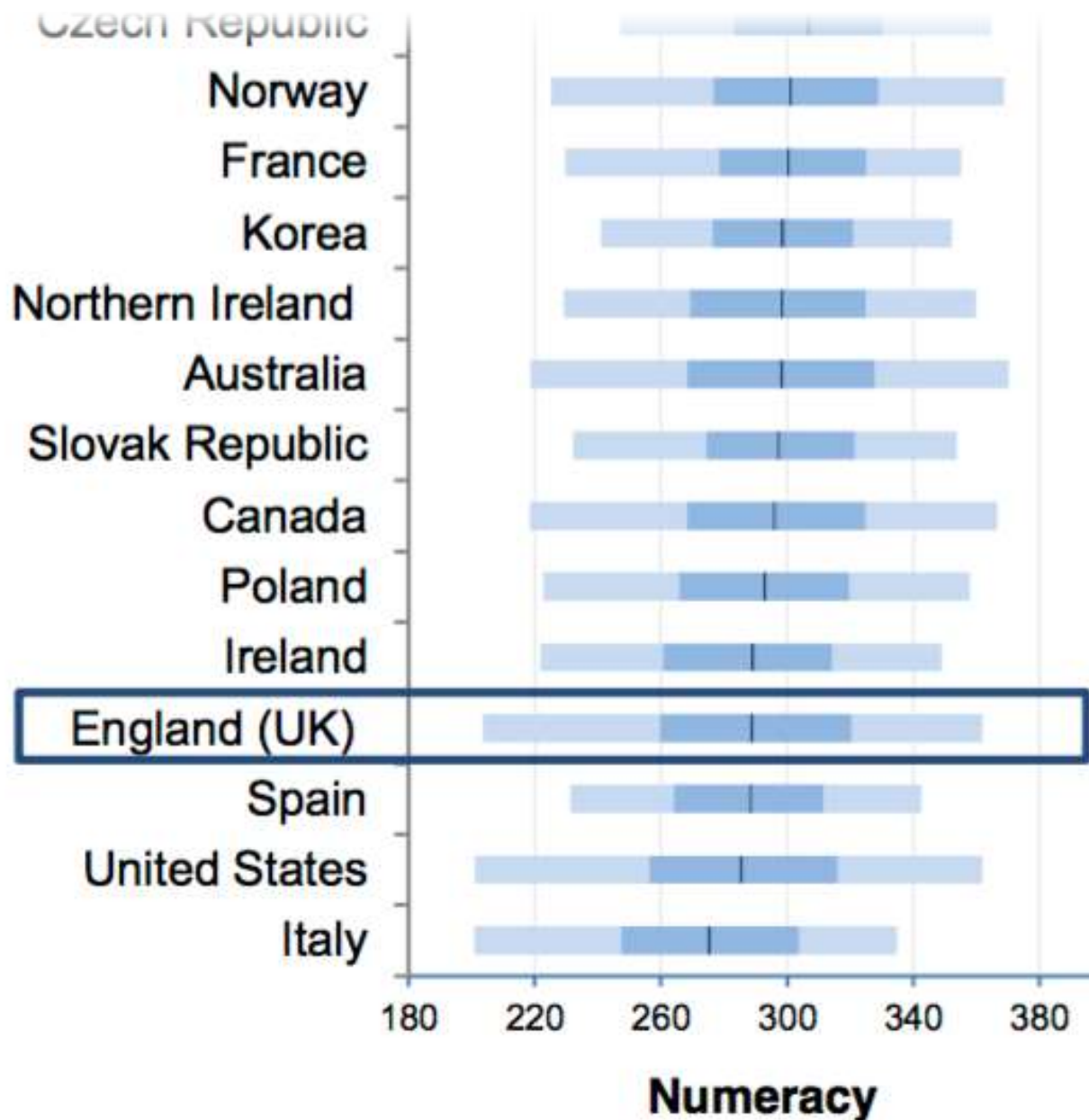


TABLE 2: WHAT ARE THE PARTICIPATION RATES IN UPPER SECONDARY MATHEMATICS EDUCATION?

	Studying any mathematics	Studying advanced mathematics
England	20%-26%	13%
Germany (Rhineland-Palatinate)	>90%	8%-14%
Hong Kong	>95%	22–23%
New Zealand	71% (Y12), 44% (Y13)	66% (Y12), 40% (Y13)
Scotland	48% (S5), 21% (S6)	27%
Singapore	66%	39%
USA (Massachusetts)	>84%	>16%



Numeracy Skills: University Students



‘England has more university students with weak numeracy and literacy skills than most other countries.’

OECD, 2016

<http://www.oecd.org/united-kingdom/building-skills-for-all-review-of-england.pdf>

British Academy Report

- 'UK universities suffer from a poverty of aspiration in relation to their students' quantitative skills.'
- 'With undergraduates embarking on courses with varying, and often weak, fluency in statistics, many universities have modified degree courses in a non-quantitative direction.'
- 'Students often graduate with little confidence in applying what skills they do have, which then has knock-on effects for businesses as graduates can be ill-prepared for the data demands of the workplace.'

<http://www.britac.ac.uk/news/news.cfm/newsid/1285>



Introducing Core Maths

Core Maths is a new suite of Post-16 mathematics courses and qualifications designed to produce a step-change in mathematical participation post-16, and equip a generation of young people with the mathematical skills they need to thrive in life, work, and further study.

Whatever path young people choose, they will face situations where they need to be competent and confident in dealing with numbers, data and graphs. These courses will give them the opportunity to work mathematically with authentic materials and resources and in a range of realistic contexts, outside of the world of mathematics.

Prof. Stephen Sparks, ACME Chair, 2013



Content and Approaches

Core Maths builds on and extends GCSE mathematics with a sharper focus on problem solving skills.

The course covers:

- Statistics and algebra
- Probability and estimation
- Data analysis and modelling
- Sequences and growth
- Financial planning and management
- Collaborative problem solving approaches and techniques
- Using technology and spreadsheets

- Psychology 10%
- Geography 10%
- Business 10%
- Economics 20%

Core Maths: Supporting other Subjects

We support the ethos behind the introduction of this new qualification in that it may be beneficial to a range of degree subjects that do not generally ask for A Level Mathematics but where enhanced numerical or statistical skills may be helpful. For this reason, we encourage applicants to consider taking this qualification...

Loughborough University

University Acceptance and Endorsement

- Core Maths courses are Level 3 qualifications attracting UCAS points on the same basis as AS-Levels.
- A growing number of institutions are endorsing Core Maths as awareness of the qualification grows.

The University fully supports the principles behind the introduction of the new Core Mathematics qualifications and believes they could be beneficial to students considering making an application to a range of degree subjects in the social sciences, business, and health sciences, for example.

University of Southampton



Awarding Organisations and Qualifications

- **AQA** Mathematical Studies
- **City & Guilds** Using and Applying Mathematics
- **Eduqas (WJEC)** Mathematics for Work and Life
- **OCR** Level 3 Certificates:
 - Quantitative Reasoning
 - Quantitative Problem Solving
- **Pearson (Edexcel)** Mathematics in Context

16-19 Study Programmes: DfE

Core Maths

'In most other advanced economies, the study of maths is the norm for students within their 16 to 19 education. Students who have already achieved GCSE A*-C should be encouraged to study maths at level 3 in the light of the value placed on this by employers and HE institutions.'

Getting Started

Core Maths Distinctives

Problem Solving

Mathematics in a meaningful context

Mathematical modelling

Sense making

Embracing appropriate digital technologies

Core Maths Distinctives 2

- For study, work and life
- Retain, deepen and extend
- Developing problem solving, team work and communication skills

The Core Maths Website

Home About Core Maths About the CMSP Why Core Maths? Get In Touch

[core:maths] support programme

+ IT ALL ADDS UP!

Welcome to the Core Maths Support Programme website, here you will find all the information you need to know about the new Level 3 Core Maths Qualification, whether you are a Student, Parent or Carer, Teacher, Employer or University.

Core Maths will help students develop their skills so they can benefit from them in the real world, be it in work, study or every day life.

FIND OUT MORE

Top Tips For Teaching Core Maths

03:04 HD

+ Tweet follow

Geoff Wake @geoffwake1
#coremaths @thecmsp At what speed should a supermarket door rotate? #maths #maths_inquiry #modelling pic.twitter.com/VGKEH5Jm
Retweeted by Core Maths Support



Case Studies and Resources

+ Case Studies

+ RESOURCES

Resources are shown in date order, most recently changed first

Filter by: [Number & Measures](#) [Clear All](#)

CATEGORIES

- [Number & Measures](#) ☒
- [Financial Maths](#) ☐
- [Discrete Maths](#) ☐
- [Algebra & Graphs](#) ☐
- [Probability](#) ☐
- [Statistics](#) ☐
- [Revision](#) ☐
- [Support For Other Subjects](#) ☐

London Underground


Having recapped Pythagoras' Theorem, students apply this to a real-life situation – how many steps there are on a London Underground escalator.

Budgeting and Foreign Exchange

This has the potential to be a big project, involving budgeting for an adventurous holiday or gap year; and dealing with foreign exchange rates

Mr Man's birthday

Students need to be systematic in finding dates of birth where the square of the year (the last two digits) gives the day and the month, e.g. 26/01/51, because $51^2 = 2601$.




HUDDERSFIELD NEW COLLEGE

Huddersfield New College, is a sixth form college located on the edge of the Pennines, and is the only college in West Yorkshire which gives students the option to study a mix of both A Level and BTEC...

[MORE](#)

ound come



Trying out a Core Maths Task

A sample Core Maths task:

- Million Miles

Top tips for teaching Core Maths (video from website <http://www.core-maths.org/>)

About the Session for Teachers

The session for teachers aims to:

- Inform prospective teachers about the key features of Core Maths
- Provide practical guidance on teaching approaches, resources, qualifications and sources of support

Summary

Core Maths:

- Represents a major opportunity to increase participation in mathematics post-16.
- Meets the requirements of the new participation measure for mathematics.
- Provides exactly the problem-solving approaches and practical mathematical skills that are needed in life, work and further study.
- Provides support for the mathematical elements of many other areas of the post-16 curriculum – including new A-Levels.