



***FMSP***

*Let maths  
take you further*



# *The role of universities in influencing participation in Level 3 mathematics*

“There should be clear signalling to the pre-university sector about the nature and extent of mathematical and statistical knowledge and skills needed in undergraduate degree programmes. As part of this signalling, university tutors should consider recommending the benefits of continuing with mathematical / statistical study beyond the age of 16”

Mathematical Transitions, HEA, 2014, p7

# *Is this signalling happening?*

- Since 2013 the FMSP has collected information on degree entry;
- In 2015-16 the FMSP liaised with almost 100 university degree courses relating to their mathematical entry requirements;
- In August 2016 the entry requirements for 763 degree courses commencing in September 2017 were surveyed from university webpages and online prospectuses.

# HE entry requirements - STEM

Subject	No. of courses	Maths		Further Maths	
		Required	Preferred	Required	Preferred
Mathematics G100	65	100%	0%	9%	23%
Physics F300	44	100%	0%	0%	11%
Aeronautical Engineering H400	27	100%	0%	4%	7%
Chemical Engineering H800	25	96%	0%	4%	16%
Mechanical Engineering H300	69	96%	3%	0%	6%
Electrical Engineering H600	62	90%	2%	0%	8%
Civil Engineering H200	54	89%	7%	0%	4%

# HE entry requirements - STEM

Subject	No. of courses	Maths		Further Maths	
		Required	Preferred	Required	Preferred
Computer Science G400	87	25%	7%	0%	6%
Chemistry F100	51	14%	4%	0%	0%
Biology C100	62	0%	3%	0%	0%
Economics L100/L101	70	24%	3%	0%	3%
Geography F800	57	0%	2%	0%	0%
Psychology C800	90	0%	0%	0%	0%
<b><i>All courses surveyed</i></b>	<b>763</b>	<b>49%</b>	<b>3%</b>	<b>1%</b>	<b>6%</b>

# *Examples of positive signalling*

- **AAA. Required subjects: Mathematics and Further Mathematics.** Further Mathematics will be accepted at AS Level grade A only if you additionally achieve a 3 in any STEP paper or a Merit in AEA Mathematics.

# *Examples of positive signalling*

“Our minimum requirement for A Level applicants is that you should be studying at least three A Levels including A Level Mathematics. **We encourage, but do not require, you to study A Level Further Mathematics as well - our standard offer is slightly lower for those taking A Level Further Mathematics.**

If it is not possible for you to study A Level Further Mathematics, think about studying AS Level Further Mathematics - the style of mathematics in Further Mathematics, especially Further Pure Mathematics, is similar to university mathematics and will be excellent preparation for further study.



# *Examples of positive signalling*

- AAA - AAB, including Mathematics at grade A.  
**Applicants with any of the following will usually be given the lower offer (AAB): Further Mathematics, Physics, Chemistry, Computing or Economics; Further Mathematics AS-Level at grade A; AEA or STEP in Maths.**
- **If you want to study Further Maths but your school or college is unable to provide tuition, you can find tuition through the Further Mathematics Support Programme.**

# *Examples of positive signalling*

**We give you £250 if you are taking Further Mathematics A-level, and you**

- put Essex as your firm UCAS choice, and
- obtain an A\*-B grade in Further Mathematics.

This award is in addition to any scholarship and is not affected by the grades you achieve in your other A-level subjects.

# *Examples of positive signalling*

## **Computer Science**

- **AAB: A Mathematical subject at AS level with grade B also required. The inclusion of Mathematical subjects: Mathematics, Further Mathematics, Pure Mathematics, Computing/Computer Science, and Physics may lead to lower offers.**

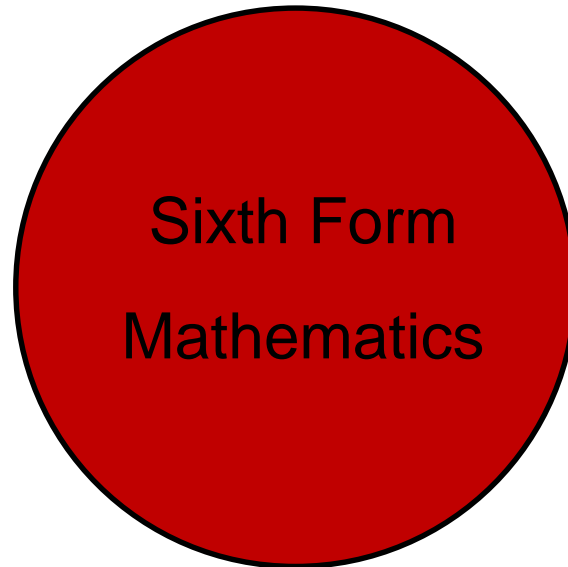
# *Examples of positive signalling*

## **Electrical Engineering**

- Our courses require students to have a good ability in complex numbers and **for students who have not studied Further Maths at A Level this can sometimes lead to problems.**

# *The vicious circle*

Universities are forced to admit  
weaker/less well prepared students



Standards falls

↓ and universities  
struggle to recruit

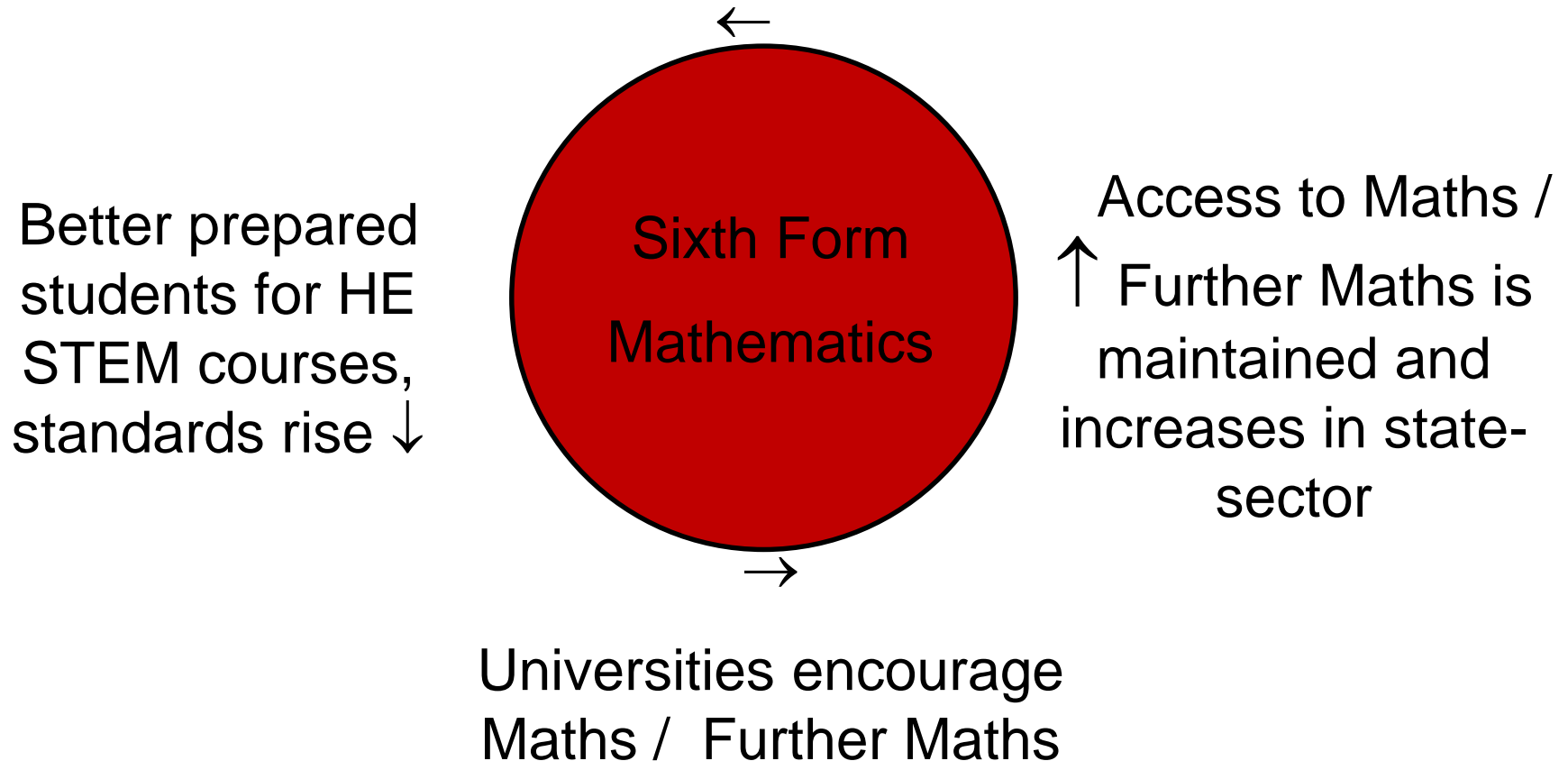


Fewer state-  
educated students  
take Maths /  
Further Maths ↑

Fewer schools/colleges able to offer A or AS  
Level Maths / Further Mathematics

# *The virtuous circle*

More state-educated students take  
Maths / Further Maths

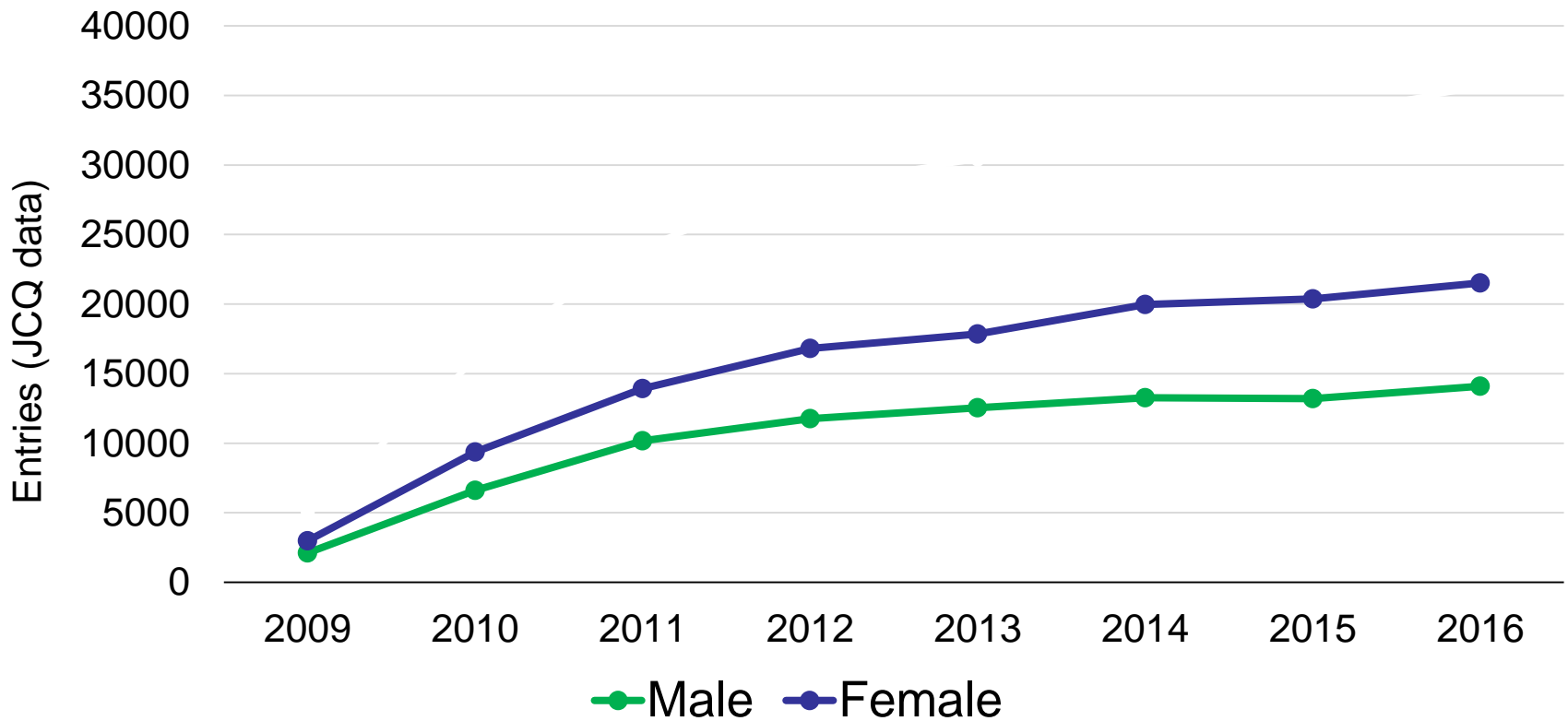


# *Positive signalling is important*

- HEIs can have a big influence on school practices
- Could you be doing more to encourage the uptake of Mathematics, Further Mathematics (A level or AS level) or Core Maths?

# Growth of EPQs

## Entries for EPQ in UK





# *Threat to AS levels from EPQs*

- Easier to staff and timetable
- EPQ worth 50% of UCAS points for A level, AS levels and Core Maths only 40%
- Universities explicit encouragement in general statements and lower conditional offers, for example: -  
**“The University of Southampton believes the EPQ offers an unparalleled introduction to the skills needed for students to thrive at leading UK universities like ours.”**

# *More signalling from HEIs*

## Further Maths and Extended Project Qualifications

- Further Maths and EPQ's are not a formal requirement for entry onto our course. However, **students with a Further Maths A-level or a relevant EPQ often find the transition to University study easier.** If you have the opportunity we would certainly encourage you to take Further Maths or an EPQ.
- If you narrowly miss your offer we will try to find you a place on the course and, every year, we are able to admit a few students in this position – typically those with the strongest grades in Physics and Mathematics, or those with additional relevant qualifications, for example, Further Maths or an EPQ

# *Positive signalling - wording*

- Is a differentiated offer possible?
- If not, could you include some positive signalling in your literature, for example: -
- “While we do not require Further Mathematics, we encourage applicants to take Further Mathematics at A levels if possible. We highly recommend and value an AS qualification in Further Mathematics.”

# *Group Discussions*

# 1) *Positive Signalling*

- Does what we currently say about mathematics, provide students, parents and teachers with the right information about the prior preparation that is required or would be beneficial?
- How could we send clearer signals about the importance of mathematics?
- Is there more we could do to provide students with clearer/explicit information (which would help maths teachers argue for the continuation of provision for AS Maths, Further Maths, and Core Maths?)

## *2) Communicating our message*

- In what ways do we communicate with potential students?
- Could working with the FMSP facilitate liaison between students, schools / colleges and universities?

# *The FMSP message*

- The pool of prospective students with advanced mathematics qualifications is widening and university departments should have greater confidence that by indicating a preference for students with A level Mathematics and/or A level Further Mathematics, they will not deter prospective applicants.
- By strengthening encouragement for AS and A level mathematics qualifications, universities will help to increase the number of students choosing to study A level Mathematics and/or Further Mathematics, and help to secure provision for these subjects in state-sector schools and colleges.

# *The FMSP provides . . .*

## *Support for students*

- Promoting the further study and appreciation of mathematics
- Helping to develop deeper problem-solving skills in mathematics
- Ensuring opportunities to study Further Mathematics, online or face to face
- Providing guidance relating to university and career choices

## *Support for teachers*

- Providing professional development for mathematics teaching at Key Stage 4 and Post -16, including support for problem-solving and extension
- Advising on mathematics provision at Key Stage 4 and Post-16
- Coordinating teacher networking opportunities
- Providing high-quality teaching and enrichment materials for mathematics

[www.furthermaths.org.uk](http://www.furthermaths.org.uk)