



Spring 2015
East of England
Regional
NEWSLETTER

Promoting Participation

Increasing participation in AS and A level Mathematics and Further Mathematics is a key priority for the FMSP. The Maths Hubs are also focusing on strategies to tackle this issue with support from the FMSP. In 2012-13, of the students taking A levels, 26% took A level Mathematics (36% for boys and 18% for girls). For Further Mathematics the proportions are much lower at 3.8% of the students taking A levels (6.5% for boys and 1.8% for girls).

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The FMSP has a well-deserved reputation for providing high quality professional development and resources to enhance the teaching of mathematics at A level. However, we are aware that the nurturing of student interest and positive attitudes to the learning of mathematics begins at a younger age. Over recent years the FMSP has broadened the range of support it provides for teachers of GCSE Mathematics and increased the number of enrichment activities which promote the continued study of mathematics to AS and A level.

The new Mathematics GCSE includes challenging assessment objectives, placing greater emphasis on reasoning, problem-solving and modelling. There is additional content to stretch students of all abilities and the content of the higher tier should provide students with a strong foundation to progress on to A level study. Exposing KS4 students to more challenging mathematical ideas and techniques helps build the confidence to take Mathematics to A level. This is particularly important in encouraging girls to opt for maths.

Over the past three years, the FMSP has been promoting the development of mathematical problem-solving skills through our CPD courses, competitions and teaching resources.

Free resources for developing problem-solving in KS4 are available on the FMSP website:

www.furthermaths.org.uk/gcse.

In February and March the FMSP has organised over 70 Maths Feasts. These half-day enrichment events are for teams of year 10 students, tackling stimulating and interesting mathematical challenges. The materials from this and previous years' competitions are available on the FMSP website:

www.furthermaths.org.uk/y10tmc-materials.

The FMSP KS4 Extension and Enrichment courses have so far provided professional development for over 900 teachers. These two-day courses combine the development of pedagogy and discussions of key issues. From May 2015 a new programme of one-day CPD courses will focus on the new Higher Tier content of GCSE Mathematics, encouraging participants to look at ways to make links between GCSE and A level Mathematics in order to encourage progression. For more details: www.furthermaths.org.uk/gcse-higher

Kevin Lord, FMSP Programme Leader



Professional Development

Teaching Further Pure 1

We have run a series of FP1 CPD days across the region this year with events being held at William de Ferrers in Essex, Voyager Academy in Peterborough and the Sir Isaac Newton Sixth Form College in Norwich. A total of 25 teachers attended the days representing 21 schools in the East of England region. Delegates took part in interactive sessions on complex numbers, matrices, sequences and series and proof by induction, covering both the content as well as tips and examples for teaching the material to students.



Mechanics 1

Eighteen teachers came to a Mechanics 1 course at the University of Hertfordshire which delved into the issues of the module including kinematics and forces. With a mix of expert exposition and group activities, the day proved extremely constructive.

Feedback comments included

"The best CPD course I've been to in a while!"

and

"It was useful to spend time looking deeply into fundamental topics."



Statistics 1: Fresh ideas for the Classroom



We were delighted to welcome Stella Dudzic, Curriculum Development Leader for MEI, to the University of East Anglia in January to deliver her popular course on teaching statistics. Ten teachers travelled from London, Cambridgeshire, Essex, Northamptonshire and Norfolk itself to hear Stella's ideas for helping students get to grips with probability, variation, the binomial distribution and correlation. In addition, Stella was able to share some of her extensive knowledge about the upcoming changes to the curriculum. Delegates took away plenty of resources that they could use right away.

Key Stage 4 Extension and Enrichment

For the third year the FMSP ran a nationwide series of KS4 Extend and Enrich two day CPD events. In the East of England these took place in Peterborough and Benfleet. Both events were well attended and provided attendees with a wide variety of extension materials and the time to try them out and discuss and reflect on how to implement them in the classroom. On the second day we heard feedback from how the activities were received when they were tested with real classes and had plenty of time for more fun maths with more resources available to trial.



Hubs and Networks

Maths Hubs

Since their official launch events in the autumn term, the maths hubs in the region have been working with the local FMSP team, particularly on projects to increase post-16 participation in mathematics. To find your local Hub, go to www.mathshubs.org.uk. Email the Maths Lead to find out what projects the Hub is working on and to have your contact details added to the mailing list.



Cambridge Hub Launch featuring keynote address by Rob Eastaway

Enigma Hub at Denbigh School, Milton Keynes

Although the Enigma Hub is located within the Southeast Region in FMSP terms, it serves schools in Bedfordshire, part of our East of England region. So we were very pleased with the opportunity to work with our Southeast neighbours to offer a course on **Managing Mixed Ability at A Level** through the Enigma Hub. The course ran in an afternoon and brought together 17 teachers from Milton Keynes, Oxfordshire, Bedfordshire and Northamptonshire. Strategies and resources were shared and discussed on the day. But a key component of the course is the gap task which teachers conduct with their own students before returning to share their results at a network meeting.

The course is scheduled to run again in May at a Bedfordshire school still to be confirmed.

Matrix Maths Hub at Herts and Essex High School

The following Hertfordshire schools are working members of a Post 16 project on promoting Key Stage 5 uptake which is running through the Matrix Hub:

The Da Vinci Studio, Highfield, John Henry Newman, Nicholas Breakspear, Nobel, Samuel Ryder, Sandringham and Townsend.

At the initial meeting we considered any barriers to progression into Key Stage 5 maths and how to use a survey to encourage students to think about studying maths after Key Stage 4.

Teacher Networks

New Hertsmere Network

The inaugural event for a new Teacher Network in Hertsmere took place on Wednesday 28th January, hosted by Hertswood School and led by FMSP Associate Phil Murray. There were representatives from Hertswood, Dame Alice Owens, Bushey Academy, Bushey Meads, Chancellors, Cavendish and QE Barnet. The 14 attending members of staff looked at some resources and ideas from A-level Active and Trigonometry, but also discussed the proposed content changes for KS5 Maths.

The next meeting is due to be on Tuesday 24th March. The planned content will be as follows: further ideas on A-level Active, plans for improving the use of technology in Maths A-level, particularly in light of the DfE subject content requirements for 2017 and pedagogical approaches to curve sketching. Please contact valpritchard@furthermaths.org.uk if you would like to know more.

New West Norfolk Network

Another new network kicked off with a meeting at Springwood High School in King's Lynn on Wednesday 23rd March. Rob Eastaway spoke to a group of 14 teachers from 5 different schools and colleges on the importance of puzzles in maths. The next meeting is planned for the summer term. Please contact kristincoldwell@furthermaths.org.uk if you would like to get involved.

Enrichment for Students

Year 10 Enrichment Day, University of Hertfordshire

We had a really active day with 170 Year 10 students visiting the University of Hertfordshire on 14th January 2015. Students heard about the applications of Maths within Google searches and String Theory, but then tried out interactive tasks linked to binary and to the volume of a cone.



Essex Enrichment Event

On the 2nd December 2014 Colchester Academy hosted a Year 10 enrichment day. The day had a number of sessions run by staff from the Department of Mathematical Sciences at the University of Essex. Students not only learned the importance of studying mathematics post 16 but also had sessions on modelling waves, the work of an actuary, the shortest distance between two points in space and time and even answered the questions of whether all infinities are the same size as each other!

Take Maths Further! Day for Year 10 at University of Cambridge

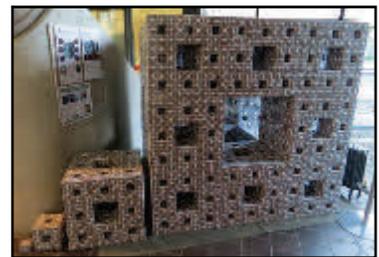


On 8th January 2015, over 100 Year 10 students visited the Centre for Mathematical Sciences (CMS) in Cambridge for a day of talks and interactive

workshops given by staff and students of the University. After an opening talk by Professor John Barrow, students were treated to workshops which included "Where can a limping seagull take you?" and "Mathematical magic", both firm favourites. The day finished with a talk on Fractals given by Dr. Katie Steckles of the University of Manchester, which linked beautifully with the MegaMenger still on display in the CMS.

MegaMenger

From October through December, schools in Cambridgeshire, Bedfordshire and Hertfordshire contributed to a worldwide fractal building project called MegaMenger. Many classes had short talks on the concept of fractals and the related mathematics before building literally thousands of cubes from business cards which were then assembled into a 1.5 metre Menger Sponge (cube with holes!).



You can find out more about the project at www.megamenger.com and you can still see the Cambridge contribution in the Centre for Mathematical Sciences, for example during the Cambridge Science Festival.

Enrichment for Students

Senior Team Maths Challenge Heats and Training Mornings

This year saw another successful series of STMC heats in the East of England. Training mornings ran at the University of Essex and the University of Hertfordshire where students had the opportunity to practise the style of questions and learn some tricks and tips in a fun environment. Following these events, heats were held at Arthur Mellows Village College, Billericay School, City of Norwich School, Centre for Mathematical Sciences (Cambridge), Longdean School, Merchant Taylor's School and Northgate School. The heats were closely fought and we congratulate the winning teams who represented the region at the national finals in London in February.



Year 10 Maths Feast

We have had a new format for the Year 10 Team Competition this year! "Maths Feasts" have been taking place around the region with many Year 10 students completing puzzles and problems as well as tackling an origami challenge.

Student reactions from the Longdean Maths Feast which had 23 competing schools:

"We learnt about set theory and Venn diagrams."

"Team work is fun!"

"We liked doing well at the Columbus cube round".



Problem-Solving Conference for Sixth Formers and Teachers

The Centre for Mathematical Sciences (CMS) in Cambridge once again played host to a Problem-Solving Conference for Sixth Formers and their teachers in the autumn. Over 100 students and teachers from 21 schools in Cambridgeshire, Bedfordshire, Hertfordshire, Essex and Norfolk came together in December to talk about the nature of problem-solving and practise their problem-solving skills. The sessions varied between lectures for the whole group and separate workshops for teachers and students. The day ended with everyone working together on some challenging problems taken from STEP/ AEA exams.

Problem-solving Classes at Voyager Academy

Following on from the Problem-Solving Conference, a series of 10 after school problem-solving classes kicked off at the Voyager Academy in Peterborough. These run on Tuesdays from 4:15 - 6:15 approximately fortnightly from January through the beginning of June. There are still a few spaces, particularly for Year 13 students who may be preparing for STEP or AEA exams this summer. To book, please follow this link:

<http://tinyurl.com/6thformprobsolv>

or contact kristincoldwell@furthermaths.org.uk for further information.

Problem-Solving Sessions for Students at University of Herts

Students from around the county have shown their mathematical dedication and travelled in spite of some snowy weather to our five Saturday mornings problem solving sessions at the University of Hertfordshire. Phil Murray introduced material and then students and some staff tackled questions on topics such as proof by contradiction, differential equations and trigonometric equations. Their work included much discussion and some presenting of solutions.

"It was great getting to attempt harder, more abstract questions."

"I made so many new friends."

"It was very useful to work with other students and cooperating to work through the same problem."

Other News and Events

Upcoming Events for Teachers

GCSE Higher Tier Course for Teachers, King John School (Benfleet), Thursday 14th May

GCSE Higher Tier Course for Teachers, City of Norwich School, Monday 18th May

Introduction to S1, Hertfordshire, Wednesday 3rd June

GCSE Higher Tier Course for Teachers, Arthur Mellows Village College (Peterborough), Tuesday 23rd June

GCSE Higher Tier Course for Teachers, Bayfordbury Observatory, Monday 29th June

AS Maths (C1&2) CPD Day, Thurston Community College, date tbc

A2 Maths (C3&4) CPD Day, Thurston Community College, date tbc

A2 Further Pure CPD Day, Thurston Community College, date tbc

Supporting STEP and AEA CPD Day, Sir Isaac Newton Sixth Form College, date tbc

*Don't forget to check the regional page for updated offerings and also for Live Online PD

Upcoming Events for Students

Year 10 Enrichment Day, University of East Anglia, Monday 23rd March

Year 10 Enrichment Day, University of Hertfordshire, Wednesday 8th July

Year 10 Enrichment Day, University of Cambridge, July tbc

Winsten Day (free Year 12 Enrichment Day), University of Essex, Thursday 2nd July

*Don't forget GCSE and A level revision videos as exams approach:

www.furthermaths.org.uk/revision

Supporting local needs

The most well-attended and successful courses that we offer are normally those that have been requested especially by teachers. If there is any aspect of Higher Tier GCSE Mathematics, A level Mathematics or A level Further Mathematics teaching that you would like support with, please ask.



The Further Mathematics Support Programme

MEI Office
Monckton House,
Epsom Centre,
White Horse Business Park,
Trowbridge, Wiltshire BA14 0XG

T 01225 716 492
F 01225 775 755

admin@furthermaths.org.uk
www.furthermaths.org.uk

Managed by MEI
Innovators in Mathematics Education
Company registration number: 3265490

Regional Contacts

EE1:
Cambridgeshire, Bedfordshire,
Norfolk
Kristin Coldwell
kristincoldwell@furthermaths.org.uk

EE2:
Essex and Suffolk
Chris Saker
chrissaker@furthermaths.org.uk

EE3:
Hertfordshire
Val Pritchard
valpritchard@furthermaths.org.uk

Regional Events pages

For teachers:
www.furthermaths.org.uk/EE_CPD

For students:
www.furthermaths.org.uk/EE_enrichment

