



Autumn 2014
Yorkshire and the
Humber Regional
NEWSLETTER

The National Picture

The Further Mathematics Support Programme (FMSP) are delighted to see a continuation of the year on year increases in the number of students participating in Mathematics and Further Mathematics, with entries reaching an all time high this summer. Mathematics is now the most popular subject at both AS and A level. AS Further Mathematics continues to grow in popularity, with an 8.5% increase on entries from 2012-13.

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Examination Results

In the UK, A level Mathematics entries rose from 88,060 in 2012/13 to 88,816 in 2013/14, a rise of 0.9%. A level Further Mathematics numbers rose from 13,821 to 14,028 over the same period, a 1.5% increase.

For AS level, entries in Mathematics rose from 150,787 to 161,711, an increase of 7.2%. For AS level Further Mathematics, numbers have risen by 8.5%, from 22,601 entries to 24,530.

In 2014-15, the FMSP will continue to work closely with schools and colleges, providing advice and guidance, CPD, enrichment at KS4 and KS5, as well as tuition in Further Mathematics when required.

Tuition

The FMSP offers various models of tuition to meet the needs of schools and colleges and their students. In addition to face-to-face tuition there are opportunities for **live online tuition (LOT)**, and **live interactive lectures (LIL)**. For more information about tuition, please see: www.furthermaths.org.uk/fmsp_tuition

The FMSP continues to expand problem-solving enrichment activities, including support for students in preparing for **STEP, AEA and MAT** examinations. See: www.furthermaths.org.uk/step_aea_support

Professional Development

The FMSP offers varied professional development for teachers including:

- **Live Online Professional Development (LOPD)** - courses designed to develop subject knowledge;
- **Teaching Advanced Mathematics (TAM)** - a year long course with the option of Masters accreditation;
- **Teaching Further Mathematics (TFM)** - a 15 month programme for teachers planning to teach Further Mathematics A level.

For more information about CPD opportunities, please see: www.furthermaths.org.uk/cpd

Podcasts

The first four episodes of a new enrichment podcast "Taking Maths Further" were made available prior to the summer break, with many more being released this term via: www.furthermaths.org.uk/podcasts

In each podcast Peter Rowlett and Katie Steckles tackle a mathematical theme interviewing people from the field and setting a related puzzle. Topics so far have included the mathematics used in nautical radar and the use of probability in crime scene investigation.

Professional Development

AQA Level 2 Certificate in Further Maths

Seventeen teachers attended this professional development course which was offered by the FMSP as part of Hull University's Engagement week. The course was run by Jean Smith and Yvonne Croasdaile. The structure of the course and its assessment were investigated as well as highlighting the areas of Maths which would be unfamiliar to GCSE students and offering access to many high quality and engaging resources to teachers. Teachers found the time spent using activities and talking to others about the course valuable.



Further Pure 1

Twelve teachers attended this course which was suitable for teachers about to start teaching FP1 for the first time. Not all topics for all specifications could be included in one day so we concentrated on Complex Numbers, Matrices, Series (standard results), Numerical Methods and Proof by Induction.

Feedback showed that the day was really useful as it provided resources to use with the students and it helped the teachers to be more confident about delivering the course.

FP1/FP2/FP3

This is a distance CPD course. The aims of the course are to present and discuss topics in a way that provides insights beyond syllabus requirements. In this way participants were endowed with not only academic leadership for the Further Pure modules but also with the ability to construct sound and exciting learning materials. The courses are managed by Dennis Almeida (area coordinator). For more information please see:

www.sheffield.ac.uk/maths/outreach

Teaching A2 Core Mathematics

On 19 June, sixteen teachers attended the first day of a two day course on teaching A2 Mathematics at Leeds Trinity University presented by Sheila Eastwood and Jane West. The topics covered were functions, trigonometry, exponentials and logarithms, and differentiation.

Some of the comments included:

- "Excellent, very useful resources"
- "Thoroughly useful day"
- "Exactly what I wanted"

KS4 and KS5 Networks

The teacher networks continue to run in most areas allowing teachers to discuss current issues, share resources and take part in CPD opportunities.

The KS4 Network in Hull concentrated on Problem Solving and Questioning at GCSE as well as discussions about the new curriculum. The KS5 Network for Hull & The East Riding received CPD from Casio showing lots of uses for the graphic calculator as well as having a demonstration using a Dynakar at a later meeting. The KS5 Network for N & NE Lincs and the one for York area both received some calculator training showing its use in the Statistics module. There were also discussions about the new Maths Hubs and the likely changes to the A level specifications.

The KS5 network groups in Calderdale, Bradford and Kirklees meet once a term. Sometimes it is just a chance to get A level teachers together to share ideas and good practice and other times we have a focus for example 'Using Step/AEA questions to challenge more able students' or 'Using Geogebra in the teaching of A level Mathematics'.

The second Leeds KS5 network meeting took place in January at Abbey Grange School and was attended by seventeen teachers. These are termly meetings to provide a chance for teachers to share ideas and to focus on topics of particular relevance to KS5 teaching. This meeting considered the issue of bridging the gap from GCSE to AS level and considered strategies and resources that different schools use. The discussion was lively and covered a lot of ground, but concluded that there is no single solution, and that any approach needs to be tailored to the particular students.

Enrichment

February Half Term Challenge

Over four hundred school students (years 7 to 10) from all over Yorkshire entered the February Half Term Mathematics Challenge. A small team of teachers helped to mark the entries (many thanks to them) and thirty two students and their families attended a celebration evening in May at the University of Leeds.

Year 10 Team Mathematics Competition

There were several heats throughout the region and we ran a final at the National Railway Museum with our colleagues from the North East.

The Hull heat was at Wyke Sixth Form College and the top three teams were:

1. Beverley Grammar Team A
2. Hornsea School
3. Beverley Grammar Team B

In York the heat was at Bootham School and the top three teams were:

1. St Mary's College, Hull
2. Ashville College, Harrogate
3. Fulford School, York

The Halifax heat was at Halifax High School and the top three teams were:

1. North Halifax Grammar School (pictured below)
2. Rastrick High School
3. The Crossley Heath School



The Grimsby heat was at Ormiston Maritime Academy and the top three teams were:

1. St James' School, Grimsby
2. Caistor Grammar School
3. Sir John Nelthorpe School, Brigg

The Sheffield heat was at the King Egbert School and the top three teams were:

1. Birkdale School
2. King Edward VII School
3. Bradfield School

The Leeds & Wakefield Heat of the Year 10 Team Mathematics Challenge was held at Rodillian School on 5 March. Eighteen teams took part in a very closely fought contest, with only one and a half points separating the top three teams. The eventual winners were Queen Elizabeth Grammar School from Wakefield (pictured below), with Grammar School at Leeds just half a point behind, and followed closely by Wakefield Girls and Horbury Academy.



Year 10 Team Maths Competition Final

The winners of the final were King Edward VII, Sheffield with Stokesley School second and Emmanuel College, Gateshead third. Well done to all the teams who took part and many thanks to all schools who hosted the events and entered teams.



Year 10 Enrichment Course

In the summer term there have been fortnightly classes, 4.30-5.45 pm on a Wednesday, at the University of Sheffield. The course gives pupils an introduction to topics beyond the syllabus. Dr James Cranch presented. For similar events please see:

www.furthermaths.org.uk/YH_enrichment

Year 10 Enrichment Day

114 pupils from local schools attended a mathematics enrichment day at the University of Sheffield. The event consisted of a carousel of exciting activities, including learning mathematics through paper folding.

Enrichment

KS4 Enrichment Day

This Enrichment day for year 10 students was held at the University of Huddersfield on July 2nd. Over one hundred students from eight schools in West Yorkshire attended.

They were allocated 3 out of a possible 5 workshop sessions:

- Game Shows, Scams and how not understanding maths could kill you!
- Predators and Prey
- The Möbius Strip
- Number Bases and Computer Graphics
- Fractals

Then all students attended the final lecture 'Learning how to swim ... or is it flying?' by Florencia Tettamanti. This was based on Fluid Dynamics and included giant smoke rings. Florencia's enthusiasm was infectious.

Comments from teachers included:

- "Inspired them to see real uses of Maths"
- "University environment is a great way to raise the ambition of our students"
- "Some good activities to try with lots of classes"
- "Maths being used in a variety of ways that the students are not used to"
- "Seeing how Maths links to other subjects and how it is used in real life"

Year 12 Enrichment Talks

Year 12 students from across the region were invited to an afternoon hosted by South Holderness School.

Dr Flo Tettamanti (pictured to the right) gave two engaging talks:

- Maths in the Simpsons
- Maths and Magic



Over 50 students and their teachers attended this exciting afternoon. Some interesting comments from students

- "It was interesting and weird to see the depth of intelligence that goes into the creation of the Simpsons"
- "Everything got you thinking about maths more"
- "Was very fun and interesting"
- "Made me realise that maths wasn't as daunting as I thought"

Taking Maths Further

This year 10 Enrichment Day was hosted by The University of York and took place on 9th July with over 100 pupils and their teachers from 7 schools attending. The pupils attended 3 out of a possible 5 workshop sessions:

- Game Shows, Scams and how not understanding maths could kill you!
- Predators and Prey
- Fun Maths
- Computer Graphics and Decisions: the mathematics of number bases
- The Mobius Strip

All pupils attended the engaging final lecture which was 'The Mathematics of Music' by Tom Button.

Comments from teachers included:

- "It's useful to see maths extended and applied to other areas"
- "Some useful extension work and ideas for standalone investigative lessons"
- "Computer graphics easily linked to existing/ external experience"
- "Games and Scams was good; the pupils understand where the tutor was coming from"
- "The fun maths and the Mobius strip were hands on and the pupils took part doing some maths and discussing interesting things"
- "Different sessions enthused different students - a good mix"

Enrichment Afternoon

Sixty students attended an enrichment afternoon on 6th May hosted by Horbury Academy in Wakefield.

They were entertained and inspired by two talks from Dr Katie Steckles on Freaky Probability and Adventures in the Fourth Dimension.

Students found the sessions interesting and informative and were fascinated by the use of mathematics in more abstract ways.

Enrichment and Revision Days

Year 12 Problem Solving

Over thirty year 12 students from seven schools attended a Problem Solving event at the University of Huddersfield on July 11th. A teacher from each school also attended.

For some sessions the students and teachers worked separately. The students tackled some Fun Maths problems and took part in a session on writing and presenting solutions. The teachers were given some information on MAT, STEP and AEA and then worked on some problems to prepare to support their students.

The other sessions involved students and teachers working together to develop 'the problem solving mindset' through a mini lecture and working on a range of problems together.

Some teacher comments were:

- "Challenged me to develop problem solving within A level Maths lessons"
- "Being able to learn 'new tricks' to help solve problems"

Some student comments were:

- "Fantastic! Met some new nice people as well"
- "It helped me consider my approach to mathematical problems"

Year 8 Enrichment Morning

Fifty year 8 pupils from the Hull area and their teachers attended this event which was arranged by the FMSP with the help of Hull University's Maths Teacher Education Department.

There were two workshop sessions concentrating on problem solving skills offered by Jean Smith (FMSP) and Keith Porteous (Hull University). One used the Fun Maths resources (Liverpool Mathematical Society) with pupils working in pairs and the other session gave pupils a chance to work as a team on three separate problems.

These sessions enabled pupils to improve both their problem solving skills and their maths communication skills by discussing the problems with others. The morning was enjoyed by everyone with pupils wishing it could be extended to a full day of activities.

Revision Days

GCSE A/A* Revision Day

Wilberforce Sixth Form College hosted this event and provided refreshments for all. All Hull schools were invited to bring students aiming for A* grades at GCSE to the event and eighty year 11 pupils attended from eight schools. The revision day covered topics from the Higher paper across arithmetic, algebra, shape and space and probability concentrating on the topics which were considered to be more challenging and discussing common misconceptions. We are hoping to provide a similar day for next year.

Decision 1 Revision Day

This revision Day was held at The Freedom Centre in Hull and was specifically for Edexcel Decision 1 module. Nineteen students attended the event which covered all the topics needed for this module. The aims were to increase the confidence of students and to cover any misconceptions. Some comments from the students:

- "Made me realise what I'd forgotten"
- "Covered key areas well"
- "Good teaching...Lots of handouts"

Core Mathematics Revision

In the Sheffield area revision sessions for AS and A2 mathematics were conducted by the area coordinator in April and May.

Additionally there was a weekly year 13 support course. For information on upcoming events please see: www.sheffield.ac.uk/maths/outreach

Year 12/13 Advanced Problem Solving Course

Since October 2013 there have been fortnightly classes, 4.15-5.45 pm on a Wednesday, at the University of Sheffield. This course gives a systematic introduction to advanced problem solving skills based on the year 12 pure mathematics syllabus.

The primary aim is improved preparation for the Oxford entrance (MAT), AEA and STEP examinations. After the June examinations the course dealt with year 13 materials and will continue till November 2014.

Students are given regular feedback on their responses to assignment tasks. Dr James Cranch, an FMSP associate, and Dennis Almeida present.

Other News and Events

Supporting Students with STEP, AEA and MAT

The University of York provided a STEP course for year 13 students to attend monthly meetings where they received help with preparation for interviews, mock interviews and discussed many of the STEP questions from past papers. Many Thanks to Niall Mackay for helping the FMSP provide this course, to Miklos Hartmann for running the STEP sessions and to Niall Mackay and Michael Bate for providing a Mock Interview afternoon.

The provision from York University will expand this year to provide a Year 12 Problem Solving course and a Year 13 STEP course. The sessions will be fortnightly starting in November. For more information please contact Jean Smith
jeansmith@furthermaths.org.uk

STEP Preparation Course

This is an annual course which lasts over 14 weeks, between February and June, consisting of 15 classes, 4.30-6.30 pm, at the University of Sheffield. This course provides participating students with a systematic introduction to the advanced problem solving skills required for STEP examinations. Classes are delivered by the area coordinator and the University of Sheffield School of Mathematics staff. There are also mock examinations for all 3 STEP papers. Students are given detailed feedback on their responses to assignment tasks and the mock examinations by the area coordinator.

Results this year were exceptional with 8 out of 10 Cambridge applicants successful in obtaining (at least) the minimum grade 1 in STEP 2 and 3. Applicants to Oxford and Warwick were all successful in obtaining the required STEP grade.

Again Dr Lionel Elliott will be running STEP sessions, at the University of Leeds, in 2014-15—contact Jane West if you have students who would be interested in these.

Future Events

25th Sept 2014— GCSE Problem Solving CPD – Brighthouse
 3rd Oct 2014— A2 CPD Day 2 – C4 – Leeds University
 3rd Oct 2014— AS Core Day 1 CPD Hull University
 10th Oct 2014— M1 CPD suitable for teachers who are teaching Mechanics 1 for the first time.
 13th Oct 2014— Mechanics 2 CPD York
 15th Oct 2014— KS4 Ext & Enrichment CPD Day 1 York
 20th Oct 2014—KS4 Enrichment Day Hull
 24th Oct 2014 GCSE Enrichment & Extension Day 1 – Leeds University
 11th Nov 2014—STMC York
 18th Nov 2014— STMC – Leeds University
 19th Nov 2014— STMC Hull
 24th Nov 2014— Year 12 Problem Solving Day York
 12th Dec 2014— AS Core Day 2 Hull University
 16th Jan 2015— KS4 Ext & Enrich CPD Day 2 York



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Yorkshire and Humber Events

For teachers:

www.furthermaths.org.uk/YH_CPD

For students:

www.furthermaths.org.uk/YH_enrichment

