

# Autumn Newsletter

## North West Three Maths Hub

November 2016



### Teaching for Mastery - National focus and roll out...

The national focus on Primary Maths development is shifting to encompass Secondary Maths and in particular how teaching for mastery fits in with the whole agenda of development towards new GCSEs and A levels. There are a number of development opportunities for schools and colleagues with more to follow as the term progresses.

#### The overall aim:

All Maths Hubs working together to support primary practitioners through to post 16 to have a chance to change/influence maths education across the country.

#### About our work:

As a Lead Maths Hub we provide support to all schools in the area and the NW, across all areas of maths education, including:

- Recruitment of maths specialists into teaching.
- Initial training of maths teachers and converting existing teachers into maths.
- Co-ordinating and delivering a wide range of maths continuing professional development (CPD) and school-to-school support.
- Ensuring maths leadership is developed, e.g. running a programme for aspiring heads of maths departments.
- Helping maths enrichment programmes to reach a large number of pupils from primary school onwards.

‘Teaching for Mastery’ – NW Maths Hub 3 supporting schools to develop an understanding of Mastery and working towards achieving this for all!

For further information in relation to National and Local work streams that Maths Hub NW3 is involved in please visit:

<http://www.nwmathshub3.co.uk/index.html> or follow us on twitter: @NWmathshub3

Alternatively, please don't hesitate in contacting:

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# Primary National and Local Projects

## Taking Primary 'teaching for mastery' forward

### China-England exchange learning from Shanghai

St Mary and St Thomas' CE Primary School, St Helens, lead school for NWMathsHub 3 has implemented the 5 big ideas of a Mastery approach (linked to a 5 part lesson design used as a vehicle) to implement the 3 aims of the NC. This innovative approach has been used for 3 years, since leaders returned from Shanghai. This is now being trialled and good practice visits undertaken in a large proportion of schools across Cumbria, Lancashire, Bolton, Halton, Knowsley, Cheshire, Warrington, Wigan, Sefton and St Helens. The impact has been incredible; teachers and leaders now provide rich opportunities for all pupils to reason and explain within Mathematics whilst attempting a problem in every lesson. Fluency is promoted

through this approach and intelligent practice is essential. Children make connections easily and use key vocabulary to explain their thinking. ALL children are challenged to think! Differentiation is through carefully crafted questions not through 'pre or post' teaching and/or the more traditional approach of children being given different activities or extension tasks if they complete the initial activity set (these approaches do not lead to a deeper understanding).

Two teachers- Adrian Cannell (Sefton) and Rachel Hounslow-Griffiths (Wirral) will visit Shanghai in October 2016 with the Chinese Teachers visiting the host school- Great Crosby Primary School in November. All schools across the NW will be invited to attend showcase events throughout November- further details to follow.

### Maths Master Lead Teachers

Four teachers were selected to represent NW Maths Hub 3 from: St Helens, Cheshire, Wirral and Liverpool in 2015-16. 20 schools were selected to be part of TRGs (Teacher Research Groups) in the spring/summer. These schools continue to develop and embed ideas promoted as part of the pilot. In 2016-17, 6 teachers have been selected and are currently being trained. 12 more schools have just started their TRGs with a further 36 schools ready to begin in spring 2017. 4 more Maths Masters will be recruited in summer 2017- further details to follow. Master teachers are highly trained; as a result of the national training that they receive the teachers develop enhanced mathematics subject knowledge with a

particular emphasis on progression within key areas of mathematics. They gain a deep understanding of the principles and pedagogies related to teaching for mastery and develop effective teaching, planning and assessment which support a teaching for mastery approach. They develop an appreciation of and commitment to the importance of embedded, collaborative professional development structures in the school to support deep and sustainable professional learning and practice. One of the key aims is to provide effective support for other teachers in their own school (and beyond).



## Primary Mastery Work Group schools

Each Work Group will be led by one of the Maths Hub's Mastery Specialists and involve six primary schools. During the year, they will work closely together to introduce and develop approaches to teaching for mastery.

### The Work Group activity will include:

- Each school identifying two teachers to lead developments within their school
- The two teachers working together with the Mastery Specialist and teachers from the other Work Group schools in half-termly TRG meetings and through an online community
- Each school receiving a termly support visit from the Mastery Specialist to observe teaching, support in-school TRGs, and work with the lead teachers and head teacher
- The head teacher working with the Maths Hub's leadership and other Work Group school head teachers to develop whole school policies and structures to support teaching for mastery
- The lead teachers, supported by the head teacher, working with colleagues to develop teaching for mastery approaches in the classroom, supported by professional development activity including Teacher Research Group methods

### Benefits for participating schools:

- High quality support for teacher professional development for the lead teachers, facilitated by the Mastery Specialists
- Support for the head teacher in addressing leadership issues related to teaching for mastery from the Mastery Specialist and the Maths Hub's leadership
- Opportunity to work closely with other schools also developing teaching for mastery
- No charge for participation and a grant of £1000 to help subsidise teacher release time

Work group applications will be accepted in Spring 2017 to begin in September 2017

## EYFS- Developing Mathematical fluency to raise expectation/number focus and progression:

### Number Sense project

The Work Group has been put together based on analysis of need in that schools are looking at the ramifications of Teaching for Mastery in KS1 for EY settings. Research shows that the most effective way to help schools implement educational changes is through the development of professional learning communities. Each school will receive a combination of core training; classroom based coaching sessions and some group mentoring.

#### Benefits for the teachers and schools involved:

- To become part of a professional EYFS Maths learning community
- To participate in face to face sessions, coaching sessions, TRGs and in-class support to enhance their practice
- To develop a deep understanding to the Mastery principles and how these can be used/developed/implemented in an EYFS setting
- To have a secure understanding of early number and calculation and how children progress at this stage
- Teachers have a clearer understanding of the expectations which will ease transition into KS1

#### Scaling up of the project:

2015-16: 3 schools developed and trailed this within their own classrooms, meeting on a ½ termly basis to discuss findings and develop the programme.

2016-17: 10 schools have been selected (based on an application process) to roll the programme out across their school. This will be led and ongoing support will be provided from the team.

Spring 2017- Launch to all schools; findings analysed and tweaks made to roll out the programme to 50+ schools.

## Excellent Maths teacher programme

Initially a primary focus: 30 teachers completed the programme in 2015-16. There was a demand in the region to run this for a second year based on previous year's feedback. 40 places are available for 2016-17 with sessions starting in October 2016.

See flyer:

<http://sthelenteachingschools.co.uk/wp/nwmathshub3/wp-content/uploads/sites/2/2016/06/Excellent-Maths-Teacher-Programme-2016-17.docx>

The programme was designed to build leadership capacity within the participants own school and beyond. It was used to develop the participant and other teachers within their context ultimately impacting positively on them as a leader, staff in the school and pupil outcomes and attitudes to maths.

#### Impact from previous year (2015-16):

30% of the participants gained promotion to mathematical leadership roles, 3 teachers gained a National Maths Master Role with NW Maths hub 3 and 4 and 2 teachers became Maths SLEs.

100% agreed that this programme had helped them in

progressing in their career. A large proportion of them have led development and support of NQTs, School Direct trainees and RQTs. In addition, all have provided support, training and helped to reduce the work load of colleagues whilst improving maths provision (including outcomes in their schools).

**OFSTED:** 3 schools have moved from RI to Good/Outstanding with comments in relation to the mathematics being a strength of the school.

**Based on maths end of KS2 attainment measures in 2015/16 the schools involved in the project achieved:**

60%+ (at ARE) - 100% of schools involved

80%+ (at ARE) - 75% of schools involved

**Maths leads:** at the start of the programme 38% of the participants were maths leads and at the end 75% with an additional 2 being involved in the maths team (83%).

The overall aim of the programme is to share and develop effective mathematics practice across the NW providing a school led approach to improving teaching and leadership of mathematics.

## Maths and more: Lego innovation project

This project is in the soft trial stage (1 school), the aim is to create a range of mathematical learning opportunities for Year 2 and Year 4 pupils using Lego. The school will work with Lego- 'More to Maths' resource to engage learners and encourage the use of Lego as a manipulative to deliver the content within the Y1 and 2 NC. The focus will be on the 3 aims of the NC and to promote mathematical language and explanation.

## Intervention in a Mastery Context in association with Edge Hill ECC Team

Teachers and TAs will develop their understanding and embed approaches to:

- **Mastery:** teachers will develop their practice and principles ensuring that they plan for the 5 big ideas. They will meet the needs of all children and as a result of the activity outlined below will track children identified to ensure they make progress
- **Variation theory** including: Three forms of procedural variation (same problem/ different method; same method/ different problem and varying examples) and Conceptual variation including different representations of mathematics; concept/ non-concept; the connective model
- **Diagnostic assessment:** using diagnostic assessment to prepare for planning, using diagnostic assessment to improve understanding of the learner and their needs and using diagnostic assessment to plan long term intervention
- **Managing intervention:** Three levels of intervention: in class; immediate keep up and longer term catch up

**Immediate benefits to pupils:**

Gaps will be identified by the diagnostic assessments and targeted intervention will be applied.

In 2015-16: 4 schools were selected to trial and develop the materials with the ECC team at Edge Hill University.

In 2016-17: 10 schools (10 teachers and 10 TAs) are now in the process of extending the trial with a launch to all schools planned for spring 2017. Further details to follow...

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## EEF- Y2 Reasoning Project

The project, using materials designed by researchers at Oxford University and funded by the Education Endowment Foundation (EEF) is being run in eight out of 35 Maths Hubs areas and coordinated by the NCETM. NW Maths Hub 3 is one of the eight Maths Hubs participating.

An earlier EEF trial of the programme showed a positive impact on pupils' numeracy ability.

In this larger scale project we have recruited 20 primary schools, from across the NW, to participate in the project, which will run during the school year 2016/2017. The 20 schools that have been selected, half have been chosen at random to receive the teaching intervention, the other half will carry on teaching as usual. The control group will receive training and the materials for use during the school year 2017/2018. Further details to follow...

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## KS2-3 Transition

### Reach

In 2015-16, 3 Secondary and 13 feeder primary schools from St Helens trialled the programme. This included 22 practitioners: 9 secondary including HOD/Y7 teachers and 13 Y6 teachers including 9 Maths SLs.

The programme reach increased in 2016-17 to 5 Secondary and 25 feeder primary schools from Knowsley, Liverpool, Warrington, Wirral and Wigan. This included 30 practitioners: 8 secondary including HOD/Y7 teachers and 22 Y6 teachers including 10 Maths SLs.

### Content

Sessions have given practitioners from both phases- KS2 and 3 the opportunity to collaborate. Practitioners have the opportunity to share and develop practice/policy and procedures. They have had the opportunity to share books, schemes of work and planning, conduct lesson observations and environment walks to determine WWW and EBIs- comparing and reflecting on common practice. Teachers have agreed and understand the benefits of common language ensuring consistency to enable progression across the key stages. They have developed a better understanding of progression through mathematical content/provision and as a result have improved subject knowledge across a range of mathematical concepts. It has helped to raise expectations with an increased respect and improved understanding of both phases. Teachers have had the opportunity to engage in CPD sessions based on the needs of the groups.

### Intention

It is intended that the transition between Primary (KS2) and Secondary (KS3) within all establishments will be smoother for students and therefore having a positive impact on pupils' outcomes (attainment and progress) and attitudes to learning will improve. KS3 will no longer be seen as 'The wasted years' and there will be a consistent approach to strategies and progression of themes and common language used. This project will continue to evolve based on participant feedback.

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# Secondary National and Local Projects

## TSST (SKE)- Secondary Subject Knowledge enhancement programme

This is an exciting offer for serving and returning secondary teachers who are moving into teaching mathematics, but do not have a previous mathematical qualification. It will enable staff to develop a deeper knowledge and understanding of all aspects of mathematics.

St Helens TSA successfully ran this project in 2014-15 with 10 delegates completing the training programme and in 2015-16 12 candidates. In 2016-17 we have so far recruited 20 trainees. This year we are offering two start dates—October 2016 and January 2017. This innovative **Subject Knowledge Enhancement (SKE/TSST) course** is delivered in partnership

with experienced staff from **Rainford High School** working to support the maths hub alongside extremely experienced staff from **Liverpool Hope University**.

Please see this flyer <http://bit.ly/25NGyek> for more details, including a proposed schedule for the training. All school based sessions will be delivered at Rainford High School. Expressions of interest are continuing to be taken for the January 2017 start. Please contact: Lisa Bradshaw for further details.

## China-England exchange learning from Shanghai

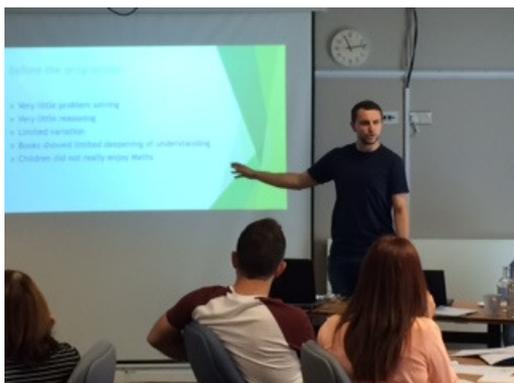
Craig Jeavons, Holmes Chapel Comprehensive School will provide a programme of support and development work involving all teachers from the lead and participating schools designed to introduce and encourage a teaching for mastery approach across the mathematics departments in those schools. The initial focus is on lesson design with a specific focus on questioning. Five schools have been selected to be involved in Stage 1 of the roll out. If you are interested in this work please contact Lisa Bradshaw.

## Maths Master Lead Teachers and work group schools

The Work Group consists of 2 strands:

**Strand 1: the secondary teaching for mastery programme.** The development of teachers selected by the Maths Hub through a NCETM professional development programme supporting them to become Secondary Mathematics Teaching for Mastery Specialists. The programme will be a mixture of face to face sessions and in-school development activities to embed approaches and processes in their own school in order to establish and strengthen a teaching for mastery approach. This will involve working with colleagues within their own school including the establishment of a Teacher Research Group (TRG).

**Strand 2: support and development work.** A programme of support and development work involving all teachers from the lead and participating schools designed to introduce and encourage a teaching for mastery approach across the mathematics departments in those schools. Activities will include the following: collaborative planning workshops, TRG-style lesson observations and dialogue in each of the “Mastery Specialist” schools during the year, visits between WG schools to support sharing of practice, visits to primary Mastery Specialist school for TRG-style lesson observations and occasional wider open-lesson events for other interested schools. The closing date for applications was 1<sup>st</sup> November. Successful applicants will be involved in an interview process. Further details to follow..



## Secondary Maths CPD Network (Whole school department development)

Secondary Maths departments will meet on ½ termly basis to explore key mathematical themes. All themes have been selected based on need. It is also thought that the whole school department approach would be more effective than just HOD meetings. Secondary Maths departments from across the NW will have the opportunity to engage in high quality CPD from experts in their field. This will provide an opportunity to network and share good practice from colleagues across the NW.

Details: <http://bit.ly/2f47kbq>

## KS3 Mathematical Reasoning Project (NCP4)

Mathematical reasoning is one of the key themes in the new National Curriculum and a focus for the Maths Hubs Network. It is essential that schools develop students who are able to think mathematically and solve problems in a range of contexts. Students need to be able to articulate their reasoning in order to deepen their understanding of the mathematics and develop solutions to problems. This workgroup enables all hubs to offer nationally coordinated support to teachers and their departments so that they can collaborate together in developing this aspect of their curriculum provision. It also provides a possible approach for departments considering how to engage with the teaching and learning implications of the new KS3 programmes of study.

In 2015-16; 10 schools were selected to pilot this programme. 4 schools have been selected to continue into Year 2- Christ the King- Southport, Byrchall High School- Wigan, St Mary's Catholic Academy-Blackpool and St Christopher's CE High school.

In 2016-17; 10 schools have been selected to begin the programme. St Hilda's high school- Liverpool, Calderstones School-Liverpool, Great Sankey High School- Warrington, South Wirral High School, Knutsford Academy, Middlewich High School- Cheshire, Tarporley High- Cheshire, Hope Academy- St Helens, St Augustine of Canterbury High- St Helens and Saints Peter and Paul Catholic College- Halton.

NCP4 provides a common workgroup structure and content with centralised training of workgroup leads and a common evaluation format.

## Secondary Maths NQT Programme

A key aim of this work group is to support teachers new to the profession to ensure they are providing a strong curriculum, teaching and professional development practices that can be shared amongst the departments they are working in and across the hub region. This Work Group has run successfully for the past two years and we intend to review and evaluate this programme on an annual basis to ensure we are continuing to meet the needs of all Maths secondary NQTs across the patch.

### Trainees will:

- Become more confident when planning and organising effective mathematical opportunities
- Have the opportunity to network with colleagues that are new to the progression
- Learn how to manage a smoothly run maths classroom ensuring all learners are engaged
- Improve progressional understanding
- Have an improved understanding of what depth looks like leading to mastery
- Create and share good quality maths resources
- Motivate pupils to enjoy maths
- Learn to embed problem solving and develop reasoning opportunities in every lesson
- Reflect and evaluate practice ready to start their RQT year

Details: <http://bit.ly/2eTzxAl>

## Useful links include:

[NCETM](https://www.ncetm.org.uk/): <https://www.ncetm.org.uk/>

[Maths Hub website](http://www.nwmathshub3.co.uk/): <http://www.nwmathshub3.co.uk/>

[Nrich](http://nrich.maths.org): <http://nrich.maths.org>

[Maths No Problem](http://www.mathsnoproblem.co.uk/): <http://www.mathsnoproblem.co.uk/>

[Inspire \(OUP\)](https://global.oup.com/education/content/primary/series/inspire-maths/?region=uk): <https://global.oup.com/education/content/primary/series/inspire-maths/?region=uk>

[Maths Associations](http://www.nwmathshub3.co.uk/associations.html): <http://www.nwmathshub3.co.uk/associations.html>



# Post-16 National and Local Projects

## FE PD leads- Maths Enrichment Programme

As a result of a very successful conference (June 2016) at the City of Liverpool College, the NW Maths Hub 3 Post 16 WG has decided to focus on supporting the development of Level 3 Maths, especially the increased participation of students and this will continue to be a priority for all Maths Hubs across the country. **A Post 16 CPD network has been developed to engage whole departments.** The target audience will be 6th form teachers/FE schools and schools with a post 16 attached. Sessions will run as ½ termly sessions, 4-6pm and will start in November 2016.

Themes will include: GCSE, how to approach and adapt to changes to engage students who get a 'C', how to engage students that get an 'E' grade (and below), Changing maths attitudes and perceptions (function/foundation and higher), alternatives to 6th Form maths and GCSE higher tier- sharing of good practice. The network is intended to encourage more schools to engage and participate in development opportunities, encouraging students to continue with mathematics post 16 including embarking on careers that include mathematics, provide support for teachers to address new curriculum and qualifications- GCSE, A Level and CM and increasing access to a wider curriculum offers including supporting existing offers i.e. FMSP, Liverpool Maths Society, CMSP and MEI.

Details: <http://bit.ly/2eej9MV>

## CMSP– Core Maths Support Programme

**Steve Nixon (Core Maths Support lead for NW Maths Hub 3)** will deliver a briefing for school leaders and Heads of 6th Form so that all participants are aware of the benefits of offering Core Maths in their schools or colleges. The briefing will be held on Monday 5<sup>th</sup> December. For further details, see this document: <http://bit.ly/2e6uBfo>

### Benefits:

- Participants gain a secure knowledge of the Core Maths curriculum and exams and understand the differences between different exam boards.
- Participants have strategies to take back to their schools and colleges regarding how Core Maths can practically fit into the post-16 curriculum, how to staff it etc. by exploring case studies and hearing from schools and colleges who are already teaching it.
- Participants understand the philosophy of Core Maths – Maths in a real life context through problem solving.

The intention is that the number of schools delivering core maths will increase.

## Underground Maths- MEI

This training has been designed to support all teachers of A level Mathematics. In order to be able to engage in all aspects of the course, participants will need to be confident with the content of AS Core Mathematics. To maximise impact and aid dissemination we encourage schools to send two teachers on this course. The aim is to bring the Underground Mathematics resources to all teachers of A level Mathematics. Sessions will run on: Day 1 – Tuesday 29th November 2016 and Day 2 – Tuesday 27th June 2017 at St Mary and St Thomas' CE Primary School, Barton Close, St Helens, WA10 2HS- TSA training centre- 20 places are available.

For further information about the training follow the link- (<http://www.mei.org.uk/underground-mathematics> ). To book a place please contact: [sarah.makin@three-saints.org.uk](mailto:sarah.makin@three-saints.org.uk) . The course, funded by the DfE, is free to participating teachers.



# CPD and Subject Leader Network Opportunities for 2016-17

## Primary CPD

The National Curriculum provides an opportunity to:

- capture, in its aims, the best mathematical education for all pupils
- represent greater ambition for all pupils, especially the lower attainers (and pupils in receipt of Pupil Premium)
- emphasises depth over acceleration
- gives us the chance to think afresh about progression, the wider aims and conceptual links. The Programmes of Study and accompanying guidance (primary) offer much more, potentially, than lists of content
- provides a context for teachers and schools to learn from each other and together (through Maths Hubs and teaching schools)

As a result of OFSTED (Primary maths findings 2015-16):

The best schools reflect a grasp of the challenges, including:

- development of the NC aims, especially reasoning and problem-solving
- ensuring pupils understand calculation strategies and make connections between different methods and operations
- how to challenge and deepen the higher attainers
- strengthening teachers' subject knowledge
- provide high quality, on-going CPD for staff based on current thinking

The weakest schools:

- limited attention given to the mathematics NC.
- lack of awareness of the aims and expectations of NC
- problem solving only occurs where it crops up in the list of content – not integral to all topics
- development of reasoning the weakest aim currently.
- schools not strong at recognising weaknesses in teachers' subject knowledge and improving it
- wide variability in the CPD provided for staff

With this in mind and based on current, innovative practice NW Maths Hub 3, led by The St Helens TSA are focusing on the 3 aims of the National Curriculum throughout the autumn/spring term. In addition; from 'modelling to mastery'; exploring and ensuring depth of learning through quality of opportunities, diminishing differences (previously closing the gap- promoting keep up, not catch up intervention strategies) and supporting teaching assistants in supporting pupils to develop and secure subject knowledge. Please see full programme attached for further information including dates/venue.

The focus for the spring and summer term will be '**Assessment of mastery' linked moderation and standardisation and supporting mathematical transitions**. These are year group based sessions and will include the opportunity for teachers to share and develop their Assessment of Mastery and develop further ideas for the Teaching of Mastery linked to Building a Mathematical Toolkit.

**There will also be an opportunity for quality assurance of Maths practice via NW Maths Hub 3 key leads as they share their experiences from current national practice and policy.**

Intervention CPD Schedule: <http://bit.ly/2dUPIXb>

Maths CPD Schedule: <http://bit.ly/2eesrsp>

## Primary Maths Subject Leaders Network

Tara Loughran will continue to deliver this network. We have 40+ subject leads that attend from St Helens, Knowsley, Wigan, Warrington, Sefton, Liverpool, Bolton and Halton.

Friday 10th March 2017 9.00am – 3.30pm: Assessment of Mastery; moderation and standardisation

Friday 23rd June 2017 9.00am – 3.30pm: Theme to be confirmed

## Secondary Heads of Department Meetings

**Lindsay Porter** (AQA associate and Secondary Maths lead) will continue to deliver this network in St Helens and Wigan. We now have 25 HOD regularly attending.

This is an opportunity for all **Heads of departments** to come together to review and share approaches to current national and local initiatives.

Sessions will take place on a termly basis at Rainford High School, St Helens.

Spring term: Monday 27<sup>th</sup> February, 1.30-3.30pm.

Summer term: Tuesday 4<sup>th</sup> July, 1.30-3.30pm.

**Themes to include:** Critical thinking and Reasoning at KS3, Learning from Shanghai and Singapore, Effective Maths transitions- KS2-3, KS3-4 and KS4-5, New GCSE support, Mastery (teaching for depth), Assessment without levels, CMSP/FMSP, subject knowledge and progressional understanding CPD sessions and resources.

Details: <http://bit.ly/2f4lrgT>

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## Post-16 CPD

NW Maths Hub 3 Post 16 CPD Network working in collaboration with CMSP/FMSP and other specialist maths practitioners is pleased to offer an academic year of Teaching and Learning CPD sessions for your whole department throughout 2016-17.

The first session will take place each at **The City of Liverpool College, Roscoe Street, L1 9DW** (within walking distance of Central Station, Liverpool Lime Street and there is a multi-storey car park on Mount Pleasant which is close by).

Details: <http://bit.ly/2eej9MV>

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## NW Maths Hubs Working Together - Annual Conference

**Tuesday 11th July 2017 at Whites Hotel, Macron Stadium, Bolton, BL6 6SF**

Featuring **Key Note Speakers:** Andrew Jeffrey (The Mathemagician) and Ems Lloyd (Director of Nrich)

**Workshops:** a range of Primary, Secondary and Post 16 available

**Marketplace:** A range of mathematical stalls to browse

**The cost of the conference is: £60.00** (includes resources, free gifts, light refreshments)

Booking details to follow

**We look forward to welcoming you all to another great Maths Conference!**

