BBO MATHS HUB NEWSLETTER

Term: Summer | Issue 7 | Date: 16 June 2022

BUCKS, BERKS AND OXON

NEWS FROM THE BBO MATHS HUB TEAM

Dear All,

I am so glad we made it and are now thinking of planning ahead. You may have already seen this hand guide from the Education Endowment Foundation and I am pleased to see that high quality teaching is first and foremost.

https://educationendowmentfoundation.org.uk/support-for-schools/school-planning-support

I also recognise that there will not be one model that fits all schools and this is also approach to all our Maths Hub work. So whether you need more support in curriculum design or would like to share your ideas in effective intervention , please do get in touch with us.

Stay safe

CONTENTS

- Page 2: PRIMARY ARTICLE Sustaining Mastery for 2022/23
- Page 3 : SECONDARY ARTICLE Using Algebra Discs
- Page 5 : PRIMARY WORK GROUPS
- Page 8 : SECONDARY WORK GROUPS
- Page 11: UPCOMING EVENTS AND OPPORTUNITIES



If you are having trouble opening the links in this newsletter in the online viewer please click on the book icon on the bottom right to disable page turn transitions





Jennie Forde, Primary Maths Hub Lead

The Sustaining Mastery work group is for all schools who would like to continue working collaboratively with the Maths Hub and other schools in their area to develop the teaching and learning of Maths. 2022/23 will be the third year of this work group. We have adapted design of the work group in the last two years to meet schools needs during the pandemic. Feedback from current groups has helped us to shape a new and exciting model for 2022/23 which we are confident will meet the needs of schools in this programme as we move forward. Whether you began your journey back in 2016 or have recently completed the Embedding phase, there will be something in this programme for all schools to continue embedding the principles of Teaching for Mastery alongside development of curriculum coherence and subject knowledge.

School Leaders of Mathematics

The year will begin with a launch event for the math leads and Head teachers to discuss and make plans for how your school with engage with what is being offered. Following that, we will work together with Subject Leaders to evaluate what you and your school needs with regards to professional development for the teaching of maths. Two full days will be offered for subject leaders, exploring your curriculum, managing and leading change and considering how to plan, deliver and maintain effective professional development within your school.



Teaching staff

In addition, schools who are signed up for the Sustaining Mastery work group will have the opportunity for teaching staff to participate in the additional strands on offer. We are in the early stages of planning but can confirm that there will be at least 3 strands of workshops. Strand 1 has been confirmed as Teaching for Mastery pedagogy and would be ideal for staff who are new to your schools or who would benefit from a recap. The other strands are yet to be confirmed but will cover elements of delivery techniques, subject knowledge and pedagogies.

It is important to note that these are not one off training events. Participants who sign up for a strand will need to attend 3 online twilight collaborative workshops, spread across the academic year. Intersessional tasks will support both subject leaders and workshop participants to move their practice forward between sessions and feedback on impact.

Schools who are currently in Sustaining or Embedding work groups should complete a statement of commitment form and return it to info@bbomathshub.org without delay to ensure a place on the programme next year. Schools who started their Teaching for Mastery journey and have taken a break are also eligible to join. If you are currently in a Sustaining Work Group and are ready to sign up for 2022/23 please **complete this form**. If you are in an Embedding Work Group and would like to join a Sustaining Work Group for 2022-23, please **complete this form**. If you have any questions or problems, please get in touch and we would be happy to talk to you.

All of our professional development is **fully funded by the DfE and free to participate** so sign up and get involved!

Using Algebra Discs

Emma Budd Secondary Mastery Specialist, The Marlborough School, Woodstock

One significant change we have made when developing mastery teaching in our department is to use more manipulatives and representations for all our students, rather than just those with lower prior attainment. This has been particularly powerful in algebra where we have made use of algebra discs.

Like and unlike terms:

Our students' first experience of algebra (apart from anything they have seen at KS2) is in year 7. At the beginning of our algebra unit, we give students a set of discs and ask them to sort the discs into groups. The associated discussion leads students to an understanding of like and unlike terms and

an appreciation that, for example, x and -xare 'like' terms because they are flip sides of the same disc. At this point we also draw out the fact that y and y2 are unlike terms. Our students are familiar with using red and blue counters to work with directed numbers, so using algebra discs builds on that previous work.



 $(\mathbf{x})(\mathbf{x})$

 (x^2)

3y²

-4y²

3y²

 (x^2)

 (x^2)

Small steps

We spend a good amount of time challenging students to recognise like and unlike terms, and have found that the discs are really impactful in supporting their understanding. This small step recognising like and unlike terms - is one that we might have glossed over in our teaching previously, when many of us would have moved quickly on to simplifying by collecting like terms, without taking the time to really embed an understanding of what is meant by like terms.

The progression through this small step allows students to move from using the discs (concrete) to working with the abstract algebraic expression. We model drawing out the discs on the board as a pictorial representation, and make sure that students can do this too. The following two sets of questions give students practice at recognising like terms and moving between concrete, pictorial and abstract representations.



SECONDARY

SECONDAR

Emma Budd Secondary Mastery Specialist, The Marlborough School, Woodstock

	EIKe of Ordike forms.	
When we then move away from variables x and y, students can draw out the discs in their books even though we no longer have the concrete representation.	5a and 12a 7b and 7c 9T and 8t	xy and 3y 3ab and 3a 4x and 4
	23 and 5	$2m^2$ and $2\sqrt{m}$

Like or Unlike Terms?

By the time students come to simplify by collecting like terms they have a really solid foundation in recognising like and unlike terms, and of using the discs to represent expressions with more than one term. We start off using variables x and y so that students can use the discs to physically 'collect' the like terms. Students progress from questions such as 'simplify y + 2y' to expressions with negative coefficients where they use zero pairs to help them simplify.



As a department we have been really pleased at how successful our students have been with this approach. For lower attaining students in particular where retention is an issue the memory of the discs is a really useful 'hook' for a reminder like 'Could you draw out the discs for this question?'.

Best moments!

- Seeing our lower attaining students recognise that y and y2 are not like terms "because I can't group the discs together"
- Seeing students confidently work with expressions like 4x 7 + x 3 knowing that the • coefficient of the x is 1, rather than ignoring it because it hasn't got a number in front of it, and simplifying to -10 "because all the constants are negative"

We have found the algebra discs an empowering tool for our students and have used them extensively. As well as using discs to simplify by collecting like terms, they were particularly effective when expanding brackets and factorising. But that's another story . . .



Primary Work Groups and Opportunities for 2022/23

PRIMARY

The Maths Hub Programme has PD opportunities for all teachers at all stages in their careers and across all phases. With all of our programmes for 2021/22 underway, we are now looking ahead to the next academic year and are pleased to announce that applications have now opened for some of our projects running in 2022/23. Follow the 'More Info' links for further details on the opportunities and how to apply on our website, or contact <u>info@bbomathshub.org.uk</u> to discuss the best programme for you and your department.

All of our Work Groups are free.

Primary Mastery Readiness

Lots of schools are ready to start their mastery journey, and some would benefit from initial support before becoming part of the full programme. Our diagram shows a school's journey towards mastery. Use it to determine where your school's journey starts (click/tap diagram to show a larger version with more detail of the journey).

Who can take part?

Schools will have an identifiable barrier to being able to successfully implement teaching for mastery at present. Barriers may include an Ofsted grading of RI or Inadequate, poor pupil progress in maths, serving an area of low social mobility, or issues in the school that have meant the implementation of sustained change has been difficult.

What is involved?

Schools with additional challenges need bespoke support to ensure their systems and cultures are conducive to a teaching for mastery approach. Those who are not yet ready to join a Teaching for Mastery Development Work Group will prepare for implementing a teaching for mastery approach which is embedded and sustained across the whole school. This will involve receiving support from Mastery Readiness Leads, and developing classroom culture and attitudes to maths that will support a teaching for mastery approach, both on the part of teachers and their pupils.

After the year-long programme, Mastery Readiness schools will be ready to progress into Development Work Groups and beyond.

There is no charge for participation in this programme. However, schools must ensure that staff are released to engage in the workshops and school visits, and that the headteacher attends events where appropriate. To find out more, including details of how to apply, click the More Info button to go to our website.

MORE INFO

Primary Teaching for Mastery - Development

The Teaching for Mastery Programme is a professional development opportunity designed to support teachers like you to develop best practice in maths in your school. It is suitable for schools interested in implementing a teaching for mastery approach to maths.

Participation in a Development Work Group enables a school to start teaching for mastery in maths across the school. Work Groups are fully funded so there is no cost for participation. Thousands of primary schools in England have already become part of this popular programme

Participants will:

- Join a small group with other teachers from your local area
- Receive expert input from a Mastery Specialist
- Meet regularly, either online or face-to-face
- Share best practice and explore ideas with peer-to-peer support
- Receive bespoke support from the Mastery Specialist
- Lay foundations for the long-term development in teaching for mastery in maths in your school



PRIMARY

Mastering Number

This project aims to secure firm foundations in the development of good number sense for all children from Reception through to Year 1 and Year 2. The aim over time is that children will leave KS1 with fluency in calculation and a confidence and flexibility with number. Attention will be given to key knowledge and understanding needed in Reception classes, and progression through KS1 to support success in the future.



Who can take part?

Lead participants from Work Group schools will be three teachers – one each from Reception, Year 1 and Year 2 – known as Lead Teachers. Some support will also be given to subject leaders and headteachers. Where appropriate, Lead Teachers are expected to support the other teachers in their year group.

This programme and its Work Groups are open to all schools that have not yet engaged with the Mastering Number Programme.

What is involved?

This programme focuses on the key knowledge and understanding needed in Reception classes, and progression through KS1. Participating schools will receive central training (online and face-to-face) and a wealth of pupil-facing resources.

There is an expectation that schools will provide a daily teaching session for all children of 10 to 15 minutes, in addition to their normal maths lesson. Lead Teachers in schools will also contribute to an online community to share practice and engage in critical reflection.

What will you learn?

- Your pupils will be able to clearly communicate their mathematical ideas
- You will develop a secure understanding of how to build firm mathematical foundations
- You will work to develop intentional teaching strategies focused on developing fluency in calculation and number sense for all children
- You will develop understanding and use of appropriate manipulatives to support your
- teaching of mathematical structures

What is the cost?

The Mastering Number Programme is fully funded by the Maths Hubs Programme so is free to participating schools. Whilst digital rekenreks are freely available online, schools taking part in the September start cohort of this programme may wish to consider purchasing class sets of physical rekenreks for Year 1 and Year 2 prior to the start of the programme.

What should you do next?

The next cohort of the Mastering Number Programme will commence in Autumn 2022 . Please click on 'More Info' to got to the Mastering Number section of the NCETM wesbite or 'Apply Now' to access the application form.

Primary Work Groups and Opportunities for 2022/23

PRIMARY

Primary Mastery Taster Sessions

The aim of all Mathematics teachers is to enable their students to develop a deep understanding of Mathematics. BBO Maths Hub runs continuous professional development which trains and supports teachers to effectively use the pedagogies which lead to this deep understanding. The leaders of our work groups are all PD lead trained and active practitioners – they share what they use with their own students. The continuous nature of what we offer helps to embed what participants learn into their practice and also gives them time to plan how this will be disseminated to their department.



Primary Teaching for Mastery 'taster' Sessions

If you would like to find out more, experience some of the pedagogies we develop, discuss why they have an impact on learning and see a lesson where they are being used then please come along to one of our taster days. These are open to any maths teacher or member of the senior leadership team in our area not in a private school or a school who has already attended Developing Mastery or has a Mastery Specialist based there.

We are currently recruiting schools for our Developing and Sustaining Mastery Work Groups for next year, these taster days will allow you to find out more and speak to Mastery Specialists who have been developing this in their own schools for several years. Everything we run is free to attend and some of the longer term and more involved programmes also come with funding towards cover costs and bespoke support within your school. Please click on the links below for more information and to book your place via Eventbrite:

<u> 17.06.22 – Waddeson Village Primary School</u> 23.06.22 – St Edburg's CE Primary School, Bicester

30.06.22 – Ladygrove Primary School, Didcot

NCETM NEWS AND FEATURES - PRIMARY







Taking on the role of maths lead in a primary school



Secondary Work Groups

SECONDARY

The Maths Hub Programme has PD opportunities for all teachers at all stages in their careers and across all phases. We are now looking ahead to the next academic year and are pleased top announce that applications have now opened for some of our projects for 2022/23. Follow the 'More Info' links for further details on the opportunities and how to apply on the NCETM website, or contact <u>info@bbomathshub.org.uk</u> to discuss the best programme for you and your department.

All of our Work Groups are free.

Secondary Teaching for Mastery - Development

Professional development to enable you to introduce teaching for mastery across your maths department

Secondary maths teachers whose schools want to introduce teaching for mastery can nominate two teachers ('Mastery Advocates') to join a Work Group. Mastery Advocates then form part of a locally-based group of teachers who meet regularly to develop professional knowledge and expertise, and receive bespoke support.

In a Teaching for Mastery Work Group, teachers collaborate with colleagues from local schools, and get support and guidance from a Local Leader of Maths Education (LLME). Participants also take away ideas to help students become more confident mathematicians, ready to tackle GCSEs and A levels, and begin to introduce and embed teaching for mastery.

Mastery Advocates

The **fully funded programme** enables you and another teacher from your school to become 'Mastery Advocates'. Initially you will be part of a Work Group for a year. You will also get in-school support from a Mastery Specialist. Beyond the first year, you will continue to work with your local Maths Hub and take part in a Work Group as you embed mastery across your department.

This programme is for state-funded secondary schools in England. Mastery Advocates should be teachers with the commitment, experience and authority to lead developmental work across a maths department. The support of the Head of Maths, and the headteacher or a member of SLT, is also essential.

This diagram shows a school's journey towards mastery. Use it to determine where your school's journey starts (click/tap diagram to show a larger version with more detail of the journey).

For more information from the NCETM about teaching for mastery, click on the button below. If you are interested in taking part in this programme in 2022-23, applications are now open. Click on 'Apply Now' to download the application form and return it to us at info@bbomathshub.org.uk.

To anyone considering joining a Work Group, I could not recommend it enough. It is arguably the best continual professional development you can get.

KS3 Maths Coordinator, London

I Implementing teaching for mastery has been a huge success. The biggest difference in our department is the shift in culture of both our teachers and our students.

Benefits

- Your students will develop a deep, secure and connected understanding of the maths they are learning
- You will begin to develop teaching for mastery approaches within your own classroom
- You and your head of department will begin to develop an understanding of the practices and principles aligned to secondary teaching for mastery
- You will begin to support the teachers in your department to develop teaching for mastery approaches in their practice



Secondary Work Groups

SECONDARY

Specialist Knowledge for Teaching Mathematics – Non Specialists - Cohort 2

Are you teaching maths outside your own specialism? Or is someone in your maths department a non-maths specialist? Of course, there's much more to teaching maths than knowing how to do the maths. And it's not always obvious how teaching skills from other subjects can be adapted for the maths classroom.

Develop mathematical subject knowledge and understand the pedagogy that underpins the teaching of it

If you are a headteacher or senior leader, and want to know more about the programme and its suitability for teachers in your school, watch this video.

Who can take part?

This programme is for non-specialist teachers of maths in state-funded schools who fit the following definition:

"A non-specialist teacher of mathematics is a teacher in a state-funded school or college that is currently teaching some mathematics or has commitment from a headteacher/executive head to teach some mathematics within the next year, who has not undertaken Initial Teacher Training (ITT) in mathematics."

What is involved?

The programme is aligned to the NCETM teaching for mastery pedagogy and is based on six key themes:

- Structure of the number system
- Operating on number
- Multiplicative reasoning
- Sequences and graphs
- Statistics and probability
- Geometry.

Participants will explore these themes, supported by an experienced secondary practitioner.

The NCETM have produced a flyer which summarises the programme and its benefits. Download it to share with colleagues.

Take part in the Work group

Bookings are still being taken for this Work Group which will continue into the next academic year. There will be a blended mix of online and face to face meetings, the latter to be held at Cheney School in Headington, Oxford (OX3 7QH). For full details and to secure your place, click on the 'Book Now' button.





Upcoming Events and Opportunities

Secondary Mastery Taster Days

Supporting Teachers to Develop a Deep Understanding of Mathematics in Students' Minds

The aim of all Mathematics teachers is to enable their students to develop a deep understanding of Mathematics. BBO Maths Hub runs continuous professional development which trains and supports teachers to effectively use the pedagogies which lead to this deep understanding. The leaders of our Work Groups are all PD lead trained and active practitioners – they share what they use with their own students. The continuous nature of what we offer helps to embed what participants learn into their practice and also gives them time to plan how this will be disseminated to their department.

If you would like to find out more, experience some of the pedagogies we develop, discuss why they have an impact on learning and see a lesson where they are being used then please sign up to one of our taster days for which you can find the details below. These are open to any maths teacher or member of the senior leadership team in our area not in a private school or a school who has already attended Developing Mastery or has a Mastery Specialist based there.

We are currently recruiting schools for our two sustained work groups for next year, which develop mastery (a deep understanding of mathematics) in its entirety. These taster days will allow you to find out more and speak to Mastery Specialists who have been developing this in their own schools for several years.

Everything we run is free to attend and some of the longer term and more involved programmes also come with funding towards cover costs and bespoke support within your school.

We are holding 1 remaining taster day this term on the following date / location, click on the link to book your place now:

Wycombe High School - Monday 20/6/22 9.30 am to 3.00 pm

NCETM NEWS AND FEATURES - SECONDARY









Visualising Data using Desmos - 16th June 4:15pm - 5:45pm

Did you know that Desmos can analyse data? Display different types of statistical charts?

In this short face to face PD session, we will learn how to manipulate data within Desmos graphing calculator and display different types of statistical charts.

This would be valuable for teachers from KS3 - KS5.

Please see: <u>https://amsp.org.uk/events/details/9827</u> for more details and to register for a place.

Dynamic Visualisation of data - hypothesis testing - 21st June 2pm - 4pm Online

This is the third in a series of explorations of what the Desmos graphing calculator and other technologies can do to enhance your teaching of statistics. The focus is on hypothesis testing and we will look at how using different samples can change what is seen in terms of data.

Please see: <u>https://amsp.org.uk/events/details/9948</u> for more details and to register for a place.

Oxfordshire and Buckinghamshire Online Network - 21st June - 4:30 - 6pm

Building in Problem-Solving - Making Transition Easier In this session, will talk about how to build in problem solving at KS3 and KS4 in order to ease transition.

Please see <u>https://amsp.org.uk/events/details/9520</u> for more details and to register for a place.



