MathsHUBS

Bespoke

Issue No.11 October 2017 NEWS from the Maths Hubs Programme

Welcome to the latest issue of Bespoke, as the Maths Hubs Programme celebrates a major new slice of funding from the DfE, which is a great vote of confidence in what teachers and Maths Hubs have achieved in the programme so far. Meanwhile, this year's projects are getting underway, and the rich mix of activity is described on the inside pages of this issue. In addition, on page 4, we'll tempt you to tackle a mathematical calculation, and then, once you've done it, ask yourself if you did it in the most fluent way.

Major new funding for Maths Hubs Programme

The Maths Hubs network is expanding its capacity.. The programme, launched in autumn 2014 and now in its fourth year, with 35 Maths Hubs across England, is to receive another £6m funding from the DfE. This is how the Education Secretary, Justine Greening, made the announcement at the Conservative Party conference in October:

"Our Maths Hubs are already spreading excellence in maths teaching. And today, I can announce that we are going to now invest a further £6 million to make sure that those Maths Hubs are in more areas where we know they need to make the biggest difference"

The exact details of where and how the programme will expand are currently being finalised, but it is certain that work in the broad area of teaching for mastery will continue to be at the heart of what Maths Hubs do. That work is being scaled up this year, with a further 140 primary teachers being developed as Mastery Specialists, bringing the total to over 400, and around 1500 schools taking part in teaching for mastery Work Groups, led by these specialists. Secondary maths teachers across the country are also continuing their collaborative work to refine the understanding of what teaching for mastery means, in practical terms, for pupils in Key Stages 3 and 4. In parallel to this, secondary schools are engaging in projects building on learning from each other on successful approaches to teaching the new A level. They are also building on what was learnt from last summer's first sitting of the **new GCSE**, and continuing with projects in **mathematical thinking and reasoning**.

There are also projects on maths in Early Years, the transition between primary and secondary school, and several in post GCSE maths.

And, characterising all work is the constant emphasis on finding effective ways for teachers to develop professionally and, to that end, increasing the number of teachers with expertise and experience in leading the professional development of others.

West Yorkshire Maths Hub

The Maths Hub led by Trinity MAT in Halifax has changed its name, from White Rose Maths Hub to West Yorkshire Maths Hub. The change, effective from September is so that the national-facing resource development work done by the maths team at Trinity MAT is kept separate from the team's leadership of the Maths Hub, which concentrates on support for local schools in and around West Yorkshire.

Mastery PD Materials

During the autumn term, the NCETM will start publishing new materials to support the professional development of primary teachers in the field of teaching for mastery. The materials have been produced within the Maths Hubs programme by a team of primary maths experts together with Mastery Specialists. They will be released in stages, starting with Number, Addition and Subtraction. Look for them at **www.ncetm.org.uk/masterypd**

National Centre for Excellence in the Teaching of Mathematics

If you would like to receive an emailed copy of future editions of Bespoke, either register with the NCETM, and you'll be emailed it automatically, or send a request to info@ncetm.org.uk with 'Add to Bespoke mailing list' in the subject line.

Maths Hubs projects in 2017-2018

Every Maths Hub is this year organising Work Groups within national projects, across the school and college phases, and addressing a range of themes. All Work Groups fit a broadly common template, namely schools and teachers at hub level engaging in professional development activities around an agreed targeted outcome, with common evaluation so that results and successes can be collectively measured, shared and fed into next year's work. Contact your local hub to find out which projects they are running.

Early years

Deep Mathematical Learning in Early Years. Laying the foundations of deep maths understanding in children is a key objective of those working in nursery and Reception classes. Work Groups in Maths Hubs will focus on this, either by a concentration on subject knowledge of the teachers or by developing the mathematical language used by children.

Primary

Teaching for Mastery. Maths Hubs, collectively, are exploring effective models of practice in three related areas:

- Early intervention, sometimes referred to as 'same-day intervention,' which aims to ensure that, from day to day, all pupils in a class keep up with the maths being taught to the whole class
- Refining teachers' understanding of lesson design is a crucial element of developing teaching for mastery. Teachers in these Work Groups will plan exemplar lessons (drawing on new Mastery PD Development materials produced by NCETM/Maths Hubs) and in so doing will improve lesson design across their school.
- How do pupils show, and how can teachers identify, 'working at expected standard' and 'greater depth of mathematical understanding?' Participants will collect and share examples from their own schools.

Teacher subject knowledge

There's more to subject knowledge that knowing how to do the maths yourself. Teachers and teaching assistants need to have a clear understanding of how a child can best initially grasp and then retain mathematical concepts. This year, Maths Hubs are running separate Work Groups in this area for primary teachers, and for TAs in primary and secondary schools.

Local leaders of maths education

Every Work Group is led, at local level, by a teacher experienced in leading maths-specific PD. Across the Maths Hubs network, this leadership capacity continues to be enhanced, by:

- developing Mastery Specialists in primary and secondary schools
- Running national workshops for Work Group leads to learn from each other.
- putting teachers through the NCETM Accredited PD Lead Programme
- maintaining local networks so these local leaders can stay in touch

Straddling the transition

Continuity from Year 5 to Year 8. Pupils sometimes stall in early Key Stage 3. This project aims to refine ways of primary and secondary teachers collaborating, to ensure continuity of mathematical learning from year 5 to Year 8. Work Groups will adopt one of two approaches:

- Focusing on a specific curriculum area, and an associated classroom-centred research question
- Deepening pupils' understanding, through KS2 and KS3, of mathematical reasoning

Collaborative school improvement

The Work Group will test a model of small groups of schools – primary, secondary or both – working together with an SLE to address maths improvement challenges together.

Secondary

Challenging topics in the new GCSE. The new GCSE presents challenges for pupils and teachers alike. Work Groups in the project will bring teachers together to share experiences, and develop teaching approaches that aim to address these new challenging areas, both for the benefit of this year's Year 11 students and those in future years.

Mathematical thinking. This Work Group offers teachers and their departments nationally coordinated support to address the reasoning and problem-solving challenges of the mathematics curriculum and its assessment in the new GCSE.

Teaching for mastery. How much do the practicalities of teaching for mastery in secondary schools differ from those in primary schools? Work Groups within this project will probe this area, either by focusing on a pedagogical aspect (for example, variation or use of manipulatives) or on a professional development approach that aligns well with teaching for mastery.

Post-16

GCSE Re-sit. Trialling new methods to support teachers of students re-sitting the new maths GCSE

Core Maths. A Work Group aimed at teachers in schools or colleges either new to Core Maths or looking to expand existing provision.

New A level using technology. Exploring ways of embedding new technology in teaching of the new maths A level.

Support post-16 mathematics leadership. Bringing post-16 school and college leaders together to trial new structures to support increased participation across all Level 3 mathematics pathways.

How to Take Part

If you'd like to participate in any of this work, then contact your local Maths Hub to find out where opportunities still exist.
www.mathshubs.org.uk

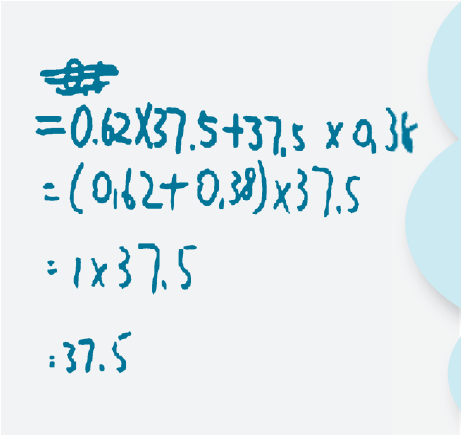
What fluency means

We think you'll enjoy this article more if you first cover up all the text beneath this introduction, and copy the sum below onto a piece of paper and, without peeking anywhere else, set about completing the calculation, without a calculator. We'll wait a moment while you do that.

0.62 x 37.5 + 3.75 x 3.8

Back with us? What answer did you get? 37.5? Correct. The much more important question, though, is: how did you do it? And, related to that: how do you think your pupils would tackle it?

The question was prompted for us when, on the Maths Hubs teacher exchange visit to Shanghai, a teacher was observed setting this task to a class of Year 7 age pupils. And here's how one pupil knocked it off.



The first thing to notice about this solution is that, the first part of the calculation was done in the child's head before putting pen to paper, namely changing

0.62 x 37.5 + 3.75 x 3.8 into

0.62 x 37.5 + 37.5 x 0.38

Once that was done, the rest of the calculation flows nicely, and gets very simple.

We think that this calculation is a wonderful illustration of how conceptual and procedural fluency can make maths simple and elegant in equal measure. Let's analyse what might have been going through this young Shanghai pupil's mind.

1. **37.5 and 3.75: Hmm, they are connected but not quite the same**
2. **How can I transform the numbers in the question – without changing the overall value – so 37.5 appears in both parts?**
3. **Ah yes, multiply the 3.75 by 10 and simultaneously divide 3.8 by 10 (I can do that because there's a multiplication sign between the two numbers)**
4. **Great, now 37.5 is a common factor, and I can rearrange/factorise the calculation**
5. **What's more, I see I now have 0.62 and 0.38. That's a bonus – they add up to one (I spotted this earlier, recognising 62 and 38 as being two numbers that add up to 100)**
6. **So, that means I have just got 1 multiplied by 37.5, which is rather easy**

Thoughts of an exchange teacher

The importance of this sort of fluency was spotted by one of the primary Mastery Specialist teachers just back from Shanghai this year. Peter Lewis-Cole, from Warberry Academy, in the Cornwall and West Devon Maths Hub, blogged about his trip, and included this paragraph.

Fluency and Logical thinking

I was amazed by how logical the children are, from a very early age, in their approach to solving mathematical problems. They are taught from an early age to look for patterns and relationships and to utilise this skill when problem solving across all content domains. This discrete focus has resulted in classrooms of students who are incredibly logical in their approach to problem solving and who are able to spot patterns/relationships that aid efficiency at lightning speed. Time is invested in classrooms and through the craft of lesson design to deliberately identify the connections and draw these out by the way that children engage with the activities set. The identification of connections is also aided enormously by students being able to recall key facts quickly and reliably. Tables, for example, are taught based on relationships: children will learn 2s and 4s together so that the 'double' relationship can be drawn out and attended to. I feel confident in saying that English children are more systematic is their approach but don't always look for or identify a connection that might be there which would make calculating more efficient.

You can read more of Peter's blog at **https://www.behindmastery.com/single-post/2017/10/01/My-Shanghai-Experience**

The Maths Hubs programme is funded by the DfE and coordinated by the National Centre for Excellence in the Teaching of Mathematics