

### Project overview

This project was funded through the Enigma Maths Hub. It involved schools from across the Hub region working together to consider and develop ways in which we could develop mastery in mathematical fluency with pupils in our own schools.

The project was led and co-ordinated by Ruth Edwards (an NCETM accredited professional development provider)

Each of us identified a focus area linked to the mastery in fluency project and we have each written up our projects.

We hope that you find the projects useful and informative for any development in Mathematical fluency at your schools.

Should you wish to find out anything further about the projects please contact the Hub rather than contacting the schools individually. We would welcome your comments.

### **Brief overview of the projects:**

<b>Developing Mastery in Mathematical fluency by .....</b>	
..... Linking with real-life problems in Year 6  Loughton Junior School, Milton Keynes	Following mock SATs analysis the identification that pupils needed to be able to become better at tackling problems with more than two stages. In this project pupils tackled a number of investigations practically and co-operatively and developed approaches about breaking problems down into smaller steps.  Read how the pupils benefited from this approach and the impact this had on their learning.
... Improving children's mastery of place value in Year 1  Kents Hill Infant School, Milton Keynes	Implementing additional shorter maths sessions to focus on the development of fluency in place value in Year 1.  Find out how Year 1 pupils were introduced to a range of resources to improve their fluency in place value.  This project also includes the impact on pupil attitudes as well as next steps.
..... Improving children's mastery of place value through representations including subitising and variation in Key Stage 1  Trinity C of E School, Aldwincle, Northants	Developing fluency by increasing conceptual understanding in place value using a range of representations including subitising and using variation to spot patterns and relationships  Read how these approaches have increased engagement and confidence.
... Improving fluency and recall of number facts across a Primary School  Barleyhurst Primary School, Milton Keynes	Improving fluency and recall of number facts using the FAST learning approach so that these key facts can then be transferred to other learning and pupils will not be hindered by being unable to recall their key facts.  Read how this approach has enabled pupils to master skills due to their increased confidence and competence with their key facts.

	<p>This report includes some data to demonstrate the improvements in speed and accuracy as pupils work towards the expectation of times tables up to <math>12 \times 2</math> by Year 4.</p>
<p>... Developing fluency by mastering number sense (place value) in Year 1  Priory Rise Primary School, Milton Keynes</p>	<p>Improving pupils' understanding of what numbers represent and the relationships between numbers in order to allow pupils to begin to develop true fluency in their maths learning. Read about the outcomes from this type of approach including recognising a big improvement in pupils' number sense across Year 1 compared to last year.</p>
<p>..... Developing mastery in fluency through the use of procedural variation (variation vs variety) in Year 4 initially  Wavendon Gate Primary School, Milton Keynes</p>	<p>Read how a subject leader and Year 4 teacher has been using procedural variation to develop mastery in fluency. By providing a combination of practise for factual and procedural fluency, children are beginning to develop conceptual fluency which can then be applied to different contexts and problems. Read how this project highlights the need for explicit teaching of the relationships and structures in maths as well as the value of additional time for practise. This project also includes some comment about the school's move towards whole class teaching from the previous setting approach.</p>
<p>..... Using Shanghai principles to improve fluency in place value in year 1.  Falconhurst Primary School, Milton Keynes</p>	<p>Read how one Maths subject leader and Year 1 teacher took some principles from Shanghai Maths and adapted them to meet the needs of the children in Year 1 to develop fluency. Findings from this project included:  <ul style="list-style-type: none"> <li>-The vulnerable and disadvantaged children making accelerated progress.</li> <li>-Expectations of the previously 'low' table were higher.</li> <li>-Children who were previously 'middle' were mastering concepts.</li> <li>-The children were using brilliant language and reasoning.</li> <li>-Everyone in the class could access the curriculum.</li> <li>-All children had a better understanding of concepts and were applying this to different areas.</li> <li>-Children spoke in full sentences in every lesson.</li> <li>-Children often used the word 'because' without prompting.</li> <li>-Children became more independent in their learning.</li> </ul> </p>
<p>..... Using models and images to aid mastery in fluency in a Primary School  Caroline Haslett Primary School, Milton Keynes</p>	<p>Find out how one subject leader worked with colleagues to achieve mastery in fluency through more regular and varied use of models and images in lessons, particularly in KS2.  The aim was for children to develop a bank of strong mental images in order to gain a deeper understanding of mathematical facts and become more fluent in applying them to a range of situations.  See how some pupils recreated problems using representations and how they were able to reason and explain their thinking.  Impact to date from this project includes: The teachers have reported that the use of apparatus and visual images has been helpful for all pupil groups including the rapid graspers. Teachers</p>

	were particularly pleased to see the positive impact that this strategy had on children's mathematical talk and explanations. Maths has become more interactive across the school with children exploring maths further and not just stopping when they get an 'answer'.
..... Developing fluency outside of the Maths lesson including home learning and extra fluency sessions....  Great Linford Primary School, Milton Keynes	<p>Find out how one maths subject leader developed a whole school approach to improving fluency for pupils including through home partnership as well as implementing a regular additional key facts sessions in school.</p> <p>This fluency project was developed to be used in partnership with parents who were keen to support their pupils and, through the project, were supported how to do so using a structured approach.</p> <p>The system was developed to have the greatest impact with the least amount of time spent, and the least amount of teacher preparation.</p> <p>The resources that have been developed by the Maths subject leader are available and would be easily adapted for use in any of your schools to develop mastery in fluency.</p> <p>The school approach also included use of FAST Maths and the celebration of improvements in key facts through increased accuracy.</p>
..... Developing a whole school approach to mental maths ..... Spring Lane Primary School, Northampton	<p>Read how a pair of maths co-ordinators are working together to develop a whole school approach to mental maths including the following aspects:</p> <ul style="list-style-type: none"> <li>• Mental maths overview</li> <li>• Developing assessments with examples for manageability</li> <li>• Developing working walls</li> <li>• Engaging parents</li> <li>• Monitoring through pupil interviews</li> </ul> <p>The implementation of the mental maths overview is beginning to be evident and mathematical fluency is definitely being given a higher profile within the curriculum.</p>
..... Developing fluency in number bonds within 10 in Year 1  Giles Brook Primary School, Milton Keynes	<p>Read how pupils in Year 1 have become more fluent with their number bonds <b>within 10</b>.</p> <p>This project outlines how the approach in Year 1 links with school priorities of developing Mastery.</p> <p>See some examples of variation type of tasks to develop fluency.</p> <p>Read this report for a list of useful websites and online games for developing fluency in number bonds.</p>