Mastery in Mathematics: Self Evaluation

This self-evaluation document is designed to support schools interested in developing a mastery approach in mathematics. Schools can identify current areas of strength and next steps. The document has not been designed to be used in isolation, e.g. it is a useful school improvement tool to summarise and follow up INSET sessions and/or staff discussions based on articles and information, such as the mastery section on the NCETM website.

The features included in the self evaluation sections builds on resources produced by NCETM and developed by the Boolean Maths Hub and are based on a feedback from schools involved in the Maths Hubs National Collaborative England-Shanghai Research Project, outcomes from the GLOWMaths Hub Mastery in Mathematics Steering Group and feedback from other schools in the UK already working on developing a mastery approach for the teaching of mathematics.

0: Currently not a feature of our practice **1**: Sometimes happens **2**: Happens fairly often but not embedded **3**: Is a central feature of our practice	0	1	2	3
Leadership — Principles and Beliefs				
Staff understand that the essential idea behind 'mastery in mathematics' is that **all pupils** need a ***deep understanding of the mathematics*** they are learning so that future mathematical learning is built on solid foundations which not need to be retaught				
Staff proactively promote a 'can do' attitude to mathematics **for all** pupils				
All pupils are encouraged to develop a growth mindset				
Staff understand classes may contain **previously** high/mid/low attainers but they do not label pupils such as 'good/no good at maths', can/can't do maths' and 'most able/less able'				
Staff believe that the vast majority of pupils can understand the key ideas in mathematics				
Staff believe success is linked to effort and hard work				
Staff understand mastery of mathematics is not a fixed state but a continuum				
Key ideas and building blocks are important for everyone				
The class work together on the same key point, whilst at the same time challenging and supporting pupils to gain depth of understanding and proficiency. Acceleration to higher content is avoided.				
Any comments on Principles and Beliefs:				
Leadership — Systems				
A set of 'positive norms' for the mathematics classroom are established including the use of 'yet', depth of understanding before speed, mistakes are valued and making connections is important				
Mathematics lessons are up to 45 minutes				
Curriculum time, beyond the mathematics lesson, is prioritised to improve 'Arithmetical Proficiency'				
'Practice makes skilled' and 'prevent the gap' sessions are identified within, and beyond, the 'normal' school day				
TAs are clear about their responsibilities during different phases of a mathematics lesson				
Teachers have access to *high quality* resources to support lesson planning (e.g.'maths manual'/text books, schemes of work/medium term plans identifying small steps and key learning points)				
Any comments on systems:				
Leadership — Mastery Curriculum				
A detailed curriculum is mapped out across all stages to support transition and ensure pupils acquire and demonstrate a sufficient grasp of the mathematics relevant to their year group				
A Medium Term Plan is mapped out across each term, ensuring longer time is prioritised for key topics				
'Themes' are designed and taught using a sequence of 'Key Learning Points'				
All pupils are expected to develop secure and deep understanding of each key point				
Medium Term Plans identify the most important things ready for the next stage/year/term				
Any comments on Mastery Curriculum:				

@MaxTheMaths
@GLOWMaths

Believe • Enjoy • Achieve
MaxTheMaths
Learners • Teachers • Leaders

MathsHUBS GLOW

Draft Oct 2015

Teaching	**Lesson Design**	Carefully crafted lesson design provides a step-by-step, conceptual journey through the mathematics, engaging pupils in reasoning and the development of mathematical thinking				
		Variation theory is at the heart of lesson design				
		Teachers design tasks incorporating positive conceptual variation *'Standard and Non-standard questions and activities'*				
		Teachers design tasks incorporating positive and negative conceptual variation *'What it is, What it's not'*				
		Teachers design tasks incorporating procedural variation *- Solving problems, routine and non-routine* *- Applying to different contexts* *- Same problem, different solutions*				
		Teachers avoids mechanical repetition and create an appropriate path for practicing the thinking process with increasing creativity (Gu 2004) *'Intelligent Practice'*				
	Classroom Practice	Concrete and pictorial representations are chosen carefully to help build procedural and conceptual knowledge together				
		Possible solutions are shared, analysed and discussed to deepen understanding *'The answer is only the beginning'*				
		Precise questioning during lessons ensures that pupils develop fluent technical proficiency and think deeply about the underpinning mathematical concepts				
		Challenge is provided by going deeper rather than accelerating into new mathematical content				
	Differentiation	Rapid graspers are challenged through more demanding problems which deepen their knowledge of the same content rather than being moved onto content from future year groups *'Differentiation by Depth'*				
		Pupils' difficulties and misconceptions are identified through immediate formative assessment and addressed with rapid intervention				
		Any comments on Teaching for Mastery:				
	Assessment	Assessment values knowing 'why' as well as knowing 'that' and knowing 'how'				
		Assessment does not solely focus on the need to memorise key facts and procedures and answer test questions accurately and quickly				
		Assessment values applying mathematics to new and unfamiliar situations				
		Both class work and homework support and develop 'intelligent practice', which helps to develop deep and sustainable knowledge				
		Fluency comes from deep knowledge and practice				
		Any comments on Assessing for Mastery:				

Next Steps:

Now	Next (When?)	Later (When?)

@MaxTheMaths
@GLOWMaths

Believe • Enjoy • Achieve
MaxTheMaths
Learners • Teachers • Leaders

MathsHUBS
GLOW

Draft Oct 2015