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 do not label pupils such as 'good/no good at maths' and 'high/low ability' (based on previous attainment)				
		Staff believe that the vast of majority of pupils can attain mastery of the key ideas in mathematics				
		Staff believe success is linked to effort 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:				
	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				
		Mastery lessons are 45 minutes				
		Curriculum time, beyond the mastery maths lesson, is prioritised to improve 'Number sense'/ 'Arithmetical Proficiency'				
		'Practice makes skilled' sessions are identified within, and beyond, the school day				
		TAs are clear about their responsibilities during different phases of a mastery 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 for learning/key points)				
		Any comments on systems:				
	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 detailed curriculum is mapped out across each term, ensuring longer time is prioritised for key topics				
		'Themes' are designed and taught using a sequence of 'Key Points'				
		All pupils are expected to master each key point				
		More time is spent on teaching key mathematical ideas and concepts to allow for the development of depth and sufficient practice to embed learning				
		Any comments on Mastery Curriculum:				

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				
		Problems are designed using **variation theory**				
		Teachers design tasks incorporating positive conceptual variation *'Standard and Non-standard'*				
		Teachers design tasks incorporating positive and negative conceptual variation *'What it is, What it isn't'*				
		Teachers design tasks incorporating procedural variation - *Same key point, apply to different contexts* - *Same problem, different solutions* - *Step by step problems, key point driven*				
		Teacher avoids mechanical repetition and creates 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?)