This self-evaluation document has been designed to support schools in establishing how they might develop a mastery approach to the teaching and learning of mathematics, building on current strengths.
This document works from a definition of mastery taken from the NCETM materials Teaching for Mastery available on https://www.ncetm.org.uk/professional-development/school-leaders/
This document has also used guidance from the documents created by the Education Endowment Foundation (EEF) IMPROVING MATHEMATICS IN THE EARLY YEARS AND KEY STAGE 1 and IMPROVING MATHEMATICS IN KEY STAGES TWO AND THREE in establishing how a school can develop their teaching and learning of mathematics. If you would like a Red Amber Green (RAG) self-assessment guide for IMPROVING MATHEMATICS IN KEY STAGES TWO AND THREE please click this link.

Using the Self Evaluation tool.

Complete the following document. If further explanation or guidance is needed. Click the 'Feature of mastery' sub header.
Any statements which are highlighted in green are from the EEF documents highlighted above.

0: Isn't something we do currently **1**: Sometimes happens/starting to think about this **2**: Happens fairly often but not embedded **3**: Is a central feature of our practice

Feature of Mastery

Underlying Principles & Beliefs	0	1	2	3
Staff understand that the essential idea behind 'mastery in mathematics' is that ***all students*** 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 believe that the vast majority of students can attain mastery of the key ideas in mathematics				

Curriculum Design	0	1	2	3
The aims of the National Curriculum are promoted: fluency, conceptual understanding, reasoning and problem solving				
A detailed curriculum is mapped out across all phases. Long and medium term planning consistent throughout the school.				
Ensure that children master each step before moving to the next stage.				

Considerable time is spent on securing fundamental skills & knowledge in the early stages.				
Teacher subject knowledge is strong across all year groups and key stages				
There is a whole school approach to fluency in key facts				

Lesson design	**0**	**1**	**2**	**3**
Lessons are carefully crafted and draw on evidence from observations of pupils in class.				
Teachers include a variety of representations to introduce and explore a concept effectively				
Teachers understand and use procedural and conceptual variation				
Teachers routinely plan questions and tasks that require children to reason				

Classroom Practice	**0**	**1**	**2**	**3**
Concrete and pictorial and abstract representations are chosen carefully to help build procedural and conceptual knowledge together				
Exercises are structured with great care to build deep conceptual knowledge alongside developing procedural fluency – intelligent practice				
Possible solutions to questions are shared, analysed and discussed to deepen understanding *'The answer is only the beginning'*				

Teaching Methods	0	1	2	3
Teachers are clear that their role is to teach in a precise way, which makes it possible for **all** pupils to engage successfully with tasks at the expected level.				
Pupils work on the same or similar tasks and engage in common discussions.				
Rapid same day intervention				

Underlying Principles and Beliefs

Staff understand that the essential idea behind 'mastery in mathematics' is that ***all students*** 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	Mastery of mathematics is not a fixed state but a continuum. Key ideas and building blocks are important for everyone. Prior learning will be revisited, and links made between prior knowledge and new learning but it will not need to be retaught.
Staff believe that the vast majority of students can attain mastery of the key ideas in mathematics	Adults proactively promote a 'can do' attitude to mathematics for all pupils. All pupils are encouraged to develop a growth mind-set. Children and adults see success is linked to effort and determination. 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.

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Curriculum Design

The aims of the National Curriculum are promoted: fluency, conceptual understanding, reasoning and problem solving A detailed curriculum is mapped out across all phases. Long and medium term planning consistent throughout the school	Long term planning sets out expectations for each year group or key stage. This builds on learning from previous year group or key stage. Medium term planning reflects assessment information. Longer time is spent on areas where children need further teaching and consolidation. Medium term planning demonstrates progression through a unit of work in small, carefully sequenced steps. Each topic builds on prior learning. Assessment information from previous year group/key stage provides teachers with information about depth of understanding across the curriculum.
Ensure that children master each step before moving to the next stage.	There are clear minimum expectations for each year that all children (except those on individualised curricula) will leave the year group having mastered. It is not expected that concepts and procedures will be retaught later in the year or the following year; instead they will be built on.
Considerable time is spent on securing fundamental skills & knowledge in the early stages.	A Year 1 unit on subtraction would cover fundamental ideas such as subtraction as take away and difference. Teachers would be clear that the words 'subtraction' and 'take away' are not interchangeable and would use them correctly. Children would practise telling subtractions stories, and e.g. might explore finding pairs of numbers with a difference of 2. They would work only within a carefully defined number set (e.g. subtraction from numbers within 10 such as 9 – 7, 5 – 2) and aim to become fluent in these – all of these important concepts would be looked at with this small fact set.
Teacher subject knowledge is strong across all year groups and key stages	Assessment information from previous year group/key stage provides teachers with information about depth of understanding across the curriculum. Teachers know what is taught in subsequent year group. Professional development should be used to raise the quality of practitioner' knowledge of mathematics, of children's mathematical development and of effective mathematical pedagogy. Developmental progressions show us how children typically learn mathematical concepts and can inform teaching. Teachers know what has been taught in previous year groups. Teachers know what is taught in their year group. Teachers understand the concepts needed to secure understanding in all areas of the curriculum.

	Teachers have good understanding of common misconceptions and how to address these. Pedagogical knowledge of their key stage is sound.
There is a whole school approach to fluency in key facts	Knowing key facts by heart lessens the cognitive load for children so that they can focus thinking on reasoning and problem solving rather than recalling facts. Teachers know what key facts must be secured in their year group or key stage. There is a policy for the teaching and learning of key facts throughout school. It shows progression and expectation and sets out the school approach. There is a focus on the learning and the application of key facts. Children who are struggling with the key year group facts are identified early and given additional practice. To enable pupils to develop a rich network of mathematical knowledge there should be an emphasis on the many connections between mathematical facts, procedures, and concepts

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Lesson design

Lessons are carefully crafted and draw on evidence from observations of pupils in class.	The lesson has a very clear focus. The lesson focuses on what children will learn (understand), not just on what children will do. Key difficult points are identified and addressed in the lesson. Teachers have well-developed AfL strategies to inform day to day teaching Lessons are broken down into small, coherent steps. Teachers may use a 'ping pong' approach when teaching each small step. Each lesson is part of a coherent learning journey. Information collected should be used to inform next steps for teaching. Developmental progressions can be useful in informing decisions around what a child should learn next.
Teachers include a variety of representations to introduce and explore a concept effectively	This includes non-concepts e.g.  Which are triangles? Which are not triangles? Why?
Teachers understand and use procedural and conceptual variation	Problems are in designed using Procedural variation, for example sequences of questions which demonstrate key ideas and structures, making small changes and asking students to notice what is the same and different as they work through problems eg 84 ÷ 6, 85 ÷ 6, 86 ÷ 6, 87 ÷ 6 Tasks are designed incorporating conceptual variation, for example looking at the same concept through different representations eg half of the area of a shape and half of a quantity,

Teachers routinely plan questions and tasks that require children to reason	Teachers understand what a complete and incomplete chain of reasoning might look like. Teachers use stem sentences with children to support their reasoning and to take learning to the point of generalisation. All teachers understand progression in reasoning and expectations for their year group or key stage. Sufficient time is provided in the lesson for children to engage in rich mathematical talk.

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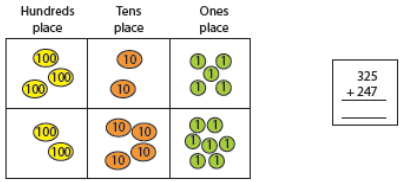
Classroom Practice

Concrete and pictorial and abstract representations are chosen carefully to help build procedural and conceptual knowledge together	Teachers know how using representations used will help children understand the maths rather than just do the maths. The CPA approach is used and understood by all adults in all year groups. Adults understand that representations should be used to help children make sense of the maths but should also be used to 'prove' or 'disprove' ideas and thinking. *Solve calculations using a place value grid and equipment alongside a column method to demonstrate understanding.*  325 + 247 Sam has completed these calculations, but he is incorrect. Explain the errors he has made. 325 + 247 = 581 355 - 247 = 112 Teacher questioning is effective. Children are required to make sense of representations and make links between representations – Where is the ten in the number sentence? Where is the ten represented in the picture? Ensure that children understand the links between the manipulatives and the mathematical ideas they represent and ensure that there is a clear rationale for using a particular manipulative or representation to teach a specific mathematical concept. Manipulatives should be temporary; they should act as a 'scaffold' that can be removed once independence is achieved
Exercises are structured with great care to build deep conceptual knowledge alongside developing procedural fluency – intelligent practice	Example of a structured exercise on multiplication using 'variation theory' to understand 'groups of 2' 2 + 2 + 2 + 2 = ___ x 2 2 + 2 + 4 + 2 = ___ x 2 4 + 4 + 4 = ___ x 2 3 x 4 = ____ x 2 *In this example the children would be taught to see groups of 2, so for the second example would be taught to see 2 groups of 2 in the 4, giving 5 groups of 2 altogether, i.e. solve it without adding 2 + 2 + 4 + 2 to give 10*

	Variation tasks might include "same subtrahend" and "same difference" 9 – 7 = 2 so 19 – 7 = ___ AND 19 - ___ = 2 29 – 7 = ___ 29 - ___ = 2 39 – 7 = ____ 39 - ____ = 2 Frequent practice like this helps children to look for and notice pattern and structure.
Possible solutions to questions are shared, analysed and discussed to deepen understanding *'The answer is only the beginning'*	Precise questioning during lessons ensures that students develop fluent technical proficiency and think deeply about the underpinning mathematical concepts Students are encouraged to use precise mathematical language and answer in full sentences Teachers plan questions to build depth as well as fluency, e.g. how can we use the idea of 'same difference' in subtraction to solve 82 – 64 = 78 - ___ without having to calculate that 82 – 64 = 18

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Teaching Methods

Teachers are clear that their role is to teach in a precise way, which makes it possible for **all** pupils to engage successfully with tasks at the expected level.	Teachers plan learning for all children but consider how they will make the learning accessible to all. Quick graspers are exposed to key concepts and are expected to demonstrate sufficient understanding before they are given further challenge.
Pupils work on the same or similar tasks and engage in common discussions.	Differentiation strategies may include: • By outcome • Use of more efficient strategies • Use of representations to either support thinking or to prove thinking • Efficient reasoning strategies • Questioning • Scaffolds Differentiation occurs in the *support and intervention provided* to different pupils, *not in the topics taught,* particularly at earlier stages. There is no differentiation in content taught, but the questioning and scaffolding individual pupils receive in class as they work through problems will differ Higher attainers are challenged through more demanding problems which deepen their knowledge of the same content rather than being moved onto content from future year groups.
Rapid same day intervention	Pupils' difficulties and misconceptions are identified through immediate formative assessment and addressed with rapid intervention – commonly through individual or small group support later the same day: there are very few "closing the gap" strategies, because there are very few gaps to close. High quality targeted support is more likely to be effective when, sessions are brief and regular; and explicit connections are made between targeted support and everyday activities or teaching. Avoid 'intervention fatigue'. Interventions do not always need to be time- consuming or intensive to be effective.

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