



*Believe. Achieve. Succeed Together.*

**Iver Village Junior School**  
**Maths Mastery Guidance 2023**

**Article 28, 29**

***Education must develop every child's personality, talents and abilities to the full***

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## What is Maths Mastery?

Teaching for mastery in primary mathematics is underpinned by the core value that all pupils can be successful mathematicians who enjoy learning. Through the careful design of the maths curriculum and individual lessons, all pupils are supported by teachers who ensure that they are actively engaged in their learning and are supported to build on their prior understanding, make connections and spot patterns.

### 5 core ideas of maths mastery

#### *1. Coherence*

A carefully sequenced curriculum, both within year groups and across year groups which allows for knowledge and skills to be built upon, in small steps. This in turn allows for pupils to develop a deep and connected understanding of mathematical concepts which they can apply to a range of contexts.

#### *2. Representation and Structure*

The mathematical structure of our number system is exposed to pupils through careful consideration of physical manipulatives and visual resources. This ensure that all pupils can 'see' the mathematical concept being taught rather than simply using resources to rehearse as specific skill.

#### *3. Mathematical thinking*

Pupils are supported to think mathematically and behave like mathematicians. They are encouraged to spot patterns and connections, reason, justify and generalise their understanding. Pupils are supported in developing their mathematical thinking through effective modelling and scaffolding of mathematical talk.

#### *4. Variation*

Variation refers to the process of developing a depth of understanding of a mathematical concept by varying some elements whilst keeping others constant.

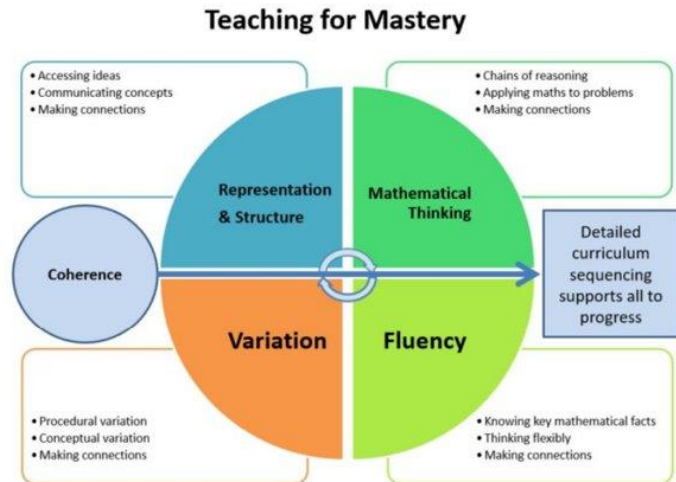
We consider two types of mathematical variation:

Procedural variation: purposeful changes made which alter the way in which pupils proceed through a learning task. Encouraging them to spot similarities and di

Conceptual variation: varying how a concept is presented e.g. representing place value of a number in a variety of ways

#### *5. Fluency*

Fluency refers to the development in automaticity in key knowledge, such as number facts and times tables, allowing for instant and accurate recall. This reduces the cognitive load upon pupils to allow them to think more deeply about key concepts and problems. In addition, it refers to



pupils' ability to be flexible with their knowledge, moving between contexts and representations confidently, make connections and choose appropriate strategies to help them to solve problems.

### ***Principles and Beliefs at Iver Village Junior School***

At Iver Village Junior School, maths is an essential aspect of our curriculum. We aim to ensure our maths teaching inspires a love for learning and equips all pupils with the necessary knowledge, skills and understanding to succeed in the next steps of their education as well as life beyond school. We firmly believe that, with the right support, all pupils can be successful mathematicians. We consider our role as teachers of primary mathematics to be essential in ensuring all pupils are equipped with the depth of understanding that provide solid foundations for future learning, both within our school and beyond.

Through careful curriculum planning and the identification of opportunities to apply their skills and knowledge, pupils develop an appreciation of the importance of maths within our day to day life. Our maths curriculum is designed to support pupils in discovering key concepts, developing fluency with numbers and using and applying their learning to a range of problems. We take a 'small steps' approach which aims to build understanding logically across lessons as well as between year groups. With an emphasis on fluency, we aim to ensure all pupils are confident learners in maths and have the necessary knowledge at their disposal in order to reduce the cognitive load when using and applying their understanding. We aim to instil in our pupils the importance of the mathematical process over the answers and encourage and praise the hard work and dedication of our pupils in the face of challenges. It is our ethos that all pupils are able to achieve within maths and value mistakes as well as success. All pupils are encouraged to respond to questions in full sentences and give a justification for their answer.

At IVJS we firmly believe that all pupils can achieve in maths, through effective support and carefully considered, adaptive teaching all pupils are able to develop their skills and understanding, at a level appropriate and personal to them.

### **Curriculum Design**

#### ***National Curriculum:***

At Iver Village Junior School, our maths curriculum has been designed with the National Curriculum at the heart. We have carefully considered the statutory requirements for each year group and ensured this is explicitly covered within our curriculum.

#### ***The maths curriculum and Iver Village Junior School***

At Iver Village Junior School, we believe that in order to build coherence in mathematical understanding and an understanding of the underlying mathematical structure pupils require their knowledge to be built sequentially in small, logical steps. Therefore, we have designed our curriculum using a 'small steps' approach with the support of the NCTEM curriculum prioritisation resources and White Rose Maths resources. The curriculum initially focusses on the areas of prioritisation identified by the NCTEM (Place Value, Addition, Subtraction,

Multiplication and Division) with other areas of the curriculum (shape, measure etc) following later in the school year in order to give a solid foundation for maths learning. The curriculum is organised into small steps which build sequentially on prior knowledge and understanding, both from previous lessons and previous year groups learning.

*Long term overviews*


Yearly overviews, taken from the White Rose Maths resources, begin each year with a focus on Number, starting with place value. This is because pupils understanding of place value is crucial to their ability to access all other aspects of the maths curriculum.

**Yearly overview**

The yearly overview provides suggested timings for each block of learning, which can be adapted to suit different term dates or other requirements.

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn	Number <b>Place value</b>		Number <b>Addition and subtraction</b>					Number <b>Multiplication and division A</b>				
Spring	Number <b>Multiplication and division B</b>		Measurement <b>Length and perimeter</b>			Number <b>Fractions A</b>		Measurement <b>Mass and capacity</b>				
Summer	Number <b>Fractions B</b>	Measurement <b>Money</b>	Measurement <b>Time</b>		Geometry <b>Shape</b>		Statistics		Consolidation			

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	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn	Number Place value				Number Addition and subtraction			Measurement Area	Number Multiplication and division A			Consolidation
Spring	Number Multiplication and division B			Measurement Length and perimeter		Number Fractions			Number Decimals A			
Summer	Number Decimals B		Measurement Money	Measurement Time		Consolidation	Geometry Shape		Statistics	Geometry Position and direction		

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Autumn	Number Place value			Number Addition and subtraction		Number Multiplication and division A			Number Fractions A			
Spring	Number Multiplication and division B			Number Fractions B		Number Decimals and percentages			Measurement Perimeter and area		Statistics	
Summer	Geometry Shape			Geometry Position and direction		Number Decimals		Number Negative numbers	Measurement Converting units		Measurement Volume	

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	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn	Number <b>Place value</b>		Number <b>Addition, subtraction, multiplication and division</b>				Number <b>Fractions A</b>		Number <b>Fractions B</b>		Measurement <b>Converting units</b>	
Spring	Ratio		Algebra		Number <b>Decimals</b>		Number <b>Fractions, decimals and percentages</b>		Measurement <b>Area, perimeter and volume</b>		Statistics	
Summer	Geometry <b>Shape</b>		Geometry <b>Position and direction</b>		Themed projects, consolidation and problem solving							

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The above overviews demonstrate how the curriculum is planned to ensure there is suitable time to embed knowledge and secure understanding of key concepts. Key procedural skills for the 4 operations are introduced within the first terms so that they can be used and applied in other topics. For example, utilising addition and subtraction skills within length and perimeter, utilising understanding of fractions to support with reading of scales in mass and capacity. In addition, there is opportunity planned throughout the curriculum for spaced practice, with key topics revisited throughout a year. These overviews are guidance for teachers to use and the small steps have been organised across the medium-term planning to reflect the expected teaching sequences. Teachers at Iver Village Junior School are encouraged and supported to adapt this based on the emerging needs of pupils identified through formative assessment.

### *Medium term plans*

Utilising the White Rose small steps as a guide, medium term plans have been devised to sequence the steps that pupils will take in their learning throughout a term. These medium-term plans are broken in to 6 week blocks and are designed to be flexible based on pupils needs. Depending on teacher assessment, pupils will complete between 3 and 5 steps each week, with one maths lesson out of 5 dedicated to arithmetic. Medium term plans also highlight the most important vocabulary or ‘essential vocabulary’ for that learning. This is not a comprehensive list of all words pupils may need or learn but the identified words that are essential and need to be introduced, learnt or used within the topic or sequence. A more comprehensive overview of maths vocabulary progression can be found in our ‘vocabulary progression’ document. Stem sentences required for accessing the learning in the planned steps can be identified in the ‘sentence stem

progression' document as well as the White Rose small step guidance and NCTM curriculum prioritisation documents.

### *Curriculum review*

In order to ensure continuous improvement of the maths curriculum at Iver Village Junior School, we aim to ensure appropriate monitoring of the curriculum and pupil progress and outcomes. The overall curriculum is reviewed as a whole annually taking into consideration, staff views, pupil views and updates to the guidance provided by White Rose and the NCTEM. All of these factors are considered and this reflection is used to update long term plans where appropriate.

Medium term planning is updated and adjusted where necessary throughout the year depending on pupils understanding and assessment of their emerging needs. This may include changing the pace at which pupils move through steps or repeating steps which are not considered to be secured. Short term (lesson planning) is updated daily as a result of daily assessment.

### **Lesson Design**

Maths lessons are planned by year group teams and adapted by individual teachers. Teachers utilise the above curriculum planning and resources to craft their lessons utilising their professional judgement and understanding of pupils' knowledge, skills and emerging skills. Although pupils in the same year group will be working on the same topics and understanding, individual lessons will reflect each class and their learning. All pupils in a class will be working on the same learning intention and additional support will be planned for and provided (detailed below) to ensure all pupils experience success within their maths lessons.

All maths lessons will follow a similar structure, although the emphasis on each section may vary depending where pupils are in their learning sequence.

<b>Aspect of lesson</b>	<b>Details</b>
<b>Fluency:</b>	1. Daily times tables 2. Daily arithmetic focus 3. Daily problem-solving focus
<b>Small step focus and learning questions:</b>	1. Introduction of lesson focus – small step building upon prior learning
<b>Vocabulary and Stem sentences:</b>	1. Key vocabulary identified for the lesson and shared with pupils. For some pupils, this may be printed or provided visually where appropriate. 2. Key stem sentences for the lesson identified and included on the introduction slide.
<b>Concrete-Pictorial-Abstract approach</b>	This approach refers to the use of different representations of key concepts which expose the underlying mathematical structure before moving to an abstract understand. This ensures pupils' conceptual understanding and fluency is

	<p>strengthened if they experience concrete, visual and abstract representations of a concept during a lesson. Moving between the concrete and the abstract helps children to connect abstract symbols with familiar contexts. Bar models, PPW (part, part, whole) and other pictorial representations are used at the same time to support pupils in making connections between physical manipulative, visual representations and the abstract concept. We consider this approach as flexible rather than progressive and all pupils move forwards and backwards through these representations throughout lessons.</p>
<p><b>Prior knowledge and Retrieval practice:</b></p>	<ol style="list-style-type: none"> <li>1. Prior to new content being introduced, there will be a retrieval practise activity based on prior learning.</li> <li>2. Pupils will be encouraged to spot the link between their prior learning and the intended new learning. Where pupils find this challenging, teachers will make the links explicit, modelling their thought process by thinking aloud. Stem sentences may be used to support pupils in verbalising the connection they have made.</li> </ol>
<p><b>New lesson content – small steps and exposing the underlying concept.</b></p>	<ol style="list-style-type: none"> <li>1. New lesson content will build logically on prior learning (from previous lessons and within the lesson).</li> <li>2. Teachers will plan for pupils to explore the mathematical structure and through concrete and pictorial examples before moving on to abstract examples.</li> <li>3. Teachers will provide pupils with a high-quality model of mathematical thinking through thinking aloud and scaffold their ability to verbalise mathematical thinking by displaying appropriate vocabulary and stem sentences on each teaching slide.</li> <li>4. Variation will be included within the examples used to help develop the depth of pupils understanding.</li> </ol>
<p><b>Problem solving and reasoning opportunities:</b></p>	<ol style="list-style-type: none"> <li>1. Within the majority of lessons there will be opportunities for pupils to solve problems and reason mathematically. The extent to which this is the focus will depend on the pupils understanding</li> </ol>



	<p>of the key concept, the balance of these opportunities may vary between lessons.</p> <p>2. Teachers will also plan for problem solving and reasoning experiences based on the progression of understanding. They will consider progression of the following skills:</p> <p><b>Describing:</b> simply telling what they did.</p> <p><b>Explaining:</b> offering some reasons for what they did. These may or may not be correct. The argument may yet not hang together coherently. This is the beginning of inductive reasoning.</p> <p><b>Convincing:</b> confident that their chain of reasoning is right and may use words such as, 'I reckon' or 'without doubt'. The underlying mathematical argument may or may not be accurate yet is likely to have more coherence and completeness than the explaining stage..</p> <p><b>Justifying:</b> a correct logical argument that has a complete chain of reasoning to it and uses words such as 'because', 'therefore', 'and so', 'that leads to' ...</p> <p><b>Proving:</b> a watertight argument that is mathematically sound, often based on generalisations and underlying structure.</p>
<p><b>Task design</b></p>	<p><b>1.Guided practice tasks:</b> It is the aim that all pupils will be active participants within their maths lessons. Lesson design will take into consideration the opportunity for guided practice in which pupils will work on variations of modelled examples to develop their understanding and skills. This will be a consistent feature throughout lessons and adapted for the needs of individuals e.g. additional scaffolding or steps to success for key pupils.</p> <p><b>2.Independent practice tasks:</b> Independent practice tasks will be carefully considered, reflecting the needs of the pupils and the intention of the lessons. Teachers will consider the skills and areas of mastery that pupils need to develop. This may utilise resources from White</p>

	Rose, NCTEM or other sources where considered appropriate.
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## Classroom Practice

<b><i>Retrieval practice</i></b>	Retrieval practice is used daily within maths lessons to support pupils to recall and utilise knowledge and skills which is embedded in long term memory. Retrieval practice is used to recap learning from previous lessons as well as previous terms or years. This allows for prior learning to be built upon. Teachers plan daily for retrieval practice and have access to resources to support this such as the White Rose 'flash back 4' which utilises
<b><i>Modelling:</i></b>	Teachers plan for explicit opportunities to model skills and mathematical thinking for pupils. This will be identified in lessons as 'I do' and may include, but is not limited to, demonstrating a method or concept, creating a task organiser to solve a problem, thinking aloud and utilising stem sentences.
<b><i>Guided Practice</i></b>	Teachers plan for guided practice opportunities for pupils to work on variations of modelled problems in order to develop their understanding and skills. Guided practice may take a 'we do' approach in which the class works together with guidance and questioning from class teacher. Guided practice may take a 'you do' approach in which pupils work in small groups, pairs or individually to solve a problem. Pupils may need a varying amount of scaffolding to access learning in this aspect of the lesson.
<b><i>Independent Practice</i></b>	Teachers plan for opportunities for independent practice. Independent practice tasks will be carefully planned to support pupils in consolidating their knowledge and understanding and opportunity. This will be related directly to the Lesson intention and provide opportunities for pupils to demonstrate the extent to which they are progressing towards meeting the intended outcome. Pupils may need further guidance and scaffolding during this time.

<b>Flexibility</b>	Teachers plan for lessons to move flexibly between modelling, guided practice and independent practice throughout the lesson which ensures pupils receive the necessary amount of support. The extent to which a lesson has emphasis on modelling, guided practice or independent practice will be dependent on pupils understanding.
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***Adaptive teaching:***

The main aim for adaptive teaching within maths is providing appropriate and timely scaffolding to allow for all pupils to access the lesson. The table below identifies some of the ways scaffolding is provided during maths lessons.

<b>Knowledge organisers and worked examples</b>	At the start of each new topic, pupils are provided with a knowledge organiser to refer to. This identifies the core knowledge and skills that pupils are learning within that topic and worked examples of key procedures they may need to utilise. This is a useful resource for pupils to refer to during their lessons.
<b>Task organisers</b>	Task organisers or steps to success are created and provided for key pupils. This helps to break down procedures in to smaller steps for pupils to follow until their skill becomes automatic. It is important that pupils understand the concept that this is built upon to ensure a depth of mathematical thinking rather than rote learning a procedure.
<b>Physical Resources</b>	As discussed above, we take a flexible approach to the C-P-A model and ensure that pupils have access to physical resources which expose mathematical concepts and structures. Pupils may need different amounts of time in each stage of the model and therefore teachers ensure the appropriate resources are available throughout a lesson for pupils to use as needed.
<b>Visual supports</b>	
<b>Adult support</b>	Different pupils may require different amounts of adult support in the form of modelling and guided practice within maths lessons. Teachers deploy support staff flexibly within lessons to provided additional support to pupils they assess as requiring further support. Teachers will also work with individuals and groups within lessons to provide additional modelling and scaffolding.

**Additional intervention**

For some pupils, additional support is required to support the development of pupils mathematical understanding. The below table identifies the types of additional intervention that may be provided. This provision is planned with support from the SENCo.

<b>Pre-teaching</b>	Some pupils are supported through pre-teaching in which key concepts and vocabulary are introduced to pupils prior to the lesson enhancing their confidence and ability to access their learning.
<b>Immediate post lesson intervention</b>	In the event that a teacher identifies a pupil(s) who have misconceptions or difficulties accessing the lesson content, additional support is aimed to be provided that day. The additional group teacher in each year group will be responsible for identifying pupils in need of the additional support and have dedicated time daily to provide intervention in order to ensure pupils are ready to progress. In the event that a large proportion of the class are not ready to progress, further lesson time will be used and medium term planning adapted.
<b>Daily times tables / number facts</b>	In order to develop fluency in number facts and times tables, some pupils require additional opportunity for practise within the school day. This will include the use of resources such as cracking maths, focussed times table booklets and times table rock stars.
<b>Arithmetic support</b>	Some pupils require further opportunities for practice of key arithmetic skills. This is to help to reduce cognitive load within maths lessons and support the development of automaticity with these procedures.
<b>Rising stars programme or other named interventions in individual support plans/EHCPs</b>	Pupils with identified needs such as SEN support or EHC plans may have named mathematical interventions on their support plans. This is factored into their individual support and occurs <b>in addition to</b> whole class maths lessons.

### Assessment

<u>Type of assessment</u>	<u>How it informs planning, teaching and learning</u>
In lesson assessment	Teachers constantly assess pupils and their ability to access learning. This informs teachers how they may need to adapt their lessons in the moment to ensure pupil understanding. Teachers will use many methods to assess pupils 'in the moment' including engagement and success in guided practice tasks, response to questions and ability to access

	independent learning tasks. The aim is to ensure pupils needs are addressed in the moment wherever possible.
Daily Assessment	Assessment of pupils' ability to access planned lessons and learning tasks will inform lessons for the following day. This will include adaptation of skills and revisiting of small steps where required. It may also include short intervention for key pupils prior to the next lesson if appropriate.
Weekly assessment	Weekly assessments are made of arithmetic skills using a Question Level Analysis (QLA) spreadsheet. Teachers use this to identify the key area for arithmetic focus for the following week, ensuring daily review of this skill.
End of block assessments	Teachers use the White Rose end of block assessments to assess pupils understanding of the block they have covered. This assessment is analysed to identify any gaps or misconceptions and used to inform future planning.
Termly assessment	End of term assessment papers which are used at the end of each term assess both pupils' attainment and progress over the course of a term. This allows teachers to understand how effective their teaching has been and make appropriate adaptations to their next term planning to meet the needs of pupils. It supports us in knowing the impact of our curriculum and allows us to adapt it further to meet the emerging needs of our pupils.