Mathematics Overview:

Mathematics is important in everyday life. It is integral to all aspects of life and with this in mind at Aston Clinton School we endeavour to ensure that children develop a positive and enthusiastic attitude towards mathematics that will stay with them beyond their time at our school. We follow a mastery approach to Mathematics using resources from Power Maths and White Rose Maths Hub to support teachers in delivering this approach.

Intent:

At Aston Clinton School, we believe that Mathematics is a key skill that helps us to make sense of the world around us. It enables children to understand and appreciate relationships and patterns in their everyday lives. Through their growing knowledge and understanding, children learn to understand and apply their knowledge to solve real life problems. Our school's curriculum drivers (Standards, Engagement, Enquiry, Diversity and Self) are woven through Mathematics to provide a wider context for learning through an interconnected narrative.

At Aston Clinton School, we also believe that Mathematics equips children with a uniquely powerful set of tools to understand and change the world. These tools include logical reasoning, problem-solving skills and the ability to think in abstract ways.

Mathematics is essential to everyday life, critical to science, technology and engineering, and necessary for financial literacy and most forms of employment. A high-quality mathematics education therefore provides a foundation for understanding the world, the ability to reason mathematically, an appreciation of the beauty and power of mathematics, and a sense of enjoyment and curiosity about the subject.

End Point - By the time our Mathematicians leave us in year 6 we want them to have:

- An understanding of the important concepts and an ability to make connections within mathematics.
- A broad range of skills in using and applying mathematics.
- Fluent knowledge and recall of number facts and the number system.
- The ability to show initiative in solving problems in a wide range of contexts, including the new or unusual.
- The ability to think independently and to persevere when faced with challenges, showing a confidence of success.
- The ability to embrace the value of learning from mistakes and false starts.

• The ability to reason, generalise and make sense of solutions.

• Fluency in performing written and mental calculations and mathematical techniques.

• A wide range of mathematical vocabulary.

• A commitment to and passion for the subject.

Implementation:

As part of the mastery approach, a positive teacher mind-set and strong subject knowledge are key to student success in Mathematics. The school is committed to providing a purposeful and empowering Mathematics curriculum. It is not the case that some pupils can do Mathematics and others cannot; no pupil should be left behind and the focus is keeping up over catching up. By making high expectations clear and emphasising the value of Mathematics education, pupils are encouraged to build confidence, resilience and aspire to achieve. Abilities are neither fixed nor innate, but can be developed through practice, support, dedication and hard work. Natural talent is just a starting point and does not determine who has more or less potential to achieve. This way, pupils at the school are broadening their horizons with a Mathematics curriculum that fully prepares learners for their next steps in their school career and opens doors to understanding their place and the place of Mathematics in the wider world, regardless of a child's background and ability.

Our Mathematics curriculum is diligently sequenced to ensure that knowledge gained is cumulative; this aids progression as well as frequently providing pupils with the opportunity to draw on knowledge from previous year groups through our spaced retrieval strategies. Through this, our pupils understand the importance of the knowledge they gain through their Mathematics lessons while at Aston Clinton and how it can be transferred to all areas of the curriculum. Providing pupils with these opportunities to put into practice what they have learnt, we aim to ensure they are not only secondary school ready but can apply what they've learnt from primary school to their future career paths.

What will you see at Aston Clinton School?

Fluent in Five

"Pupils should become fluent in the fundamentals of mathematics… so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately." DfE

KS1: "Ensure that pupils develop confidence and mental fluency with whole numbers, words and the four operations, including with practical resources." DfE

Lower KS2: "Ensure that pupils become increasingly fluent with whole numbers and the four operations, including number facts and the concept of place value. This should ensure that pupils develop efficient written and mental strategies and perform calculations accurately with increasingly large whole numbers." DfE

Upper KS2: "Ensure that pupils extend their understanding of the number system and place value to include larger integers. This should develop the connections that pupils make between multiplication and division with fractions, decimals, percentages and ratio." DfE

At Aston Clinton School, every maths lesson begins with arithmetic questions to build number fluency and confidence in 5 minutes a day. Scaffolding helps pupils choose between mental or written methods and suggests practical resources to aid their understanding. The arithmetic questions are tailored to ensure key end points are met and increase in both difficulty and pace.

Engaging maths lessons

Learning is defined as an alteration in long-term memory. If nothing has altered in long-term memory nothing has been learned.

At Aston Clinton School, we provide pupils with the opportunity to draw on knowledge from previous year groups through our spaced retrieval strategies. Spaced retrieval alters long-term memory and allows pupils to know more, remember more and do more.

At Aston Clinton School, we are enthusiastic about maths and promote a sense of enjoyment and curiosity about the subject. Engaging maths lessons ensures that the knowledge acquired can be easily retrieved and more flexibly applied in future situations; hence an alteration in long-term memory.

At Aston Clinton School, our teachers…

- Are enthusiastic about maths
- Are clear, use detailed explanations and modelling
- Ask effective questions (to stretch children to the appropriate cognitive level, teachers probe for reasoning and clarification, and, as pupils move further up the school, they are taught to give full, detailed and reasoned responses)
- Value 'maths talk'
- Encourage maths fluency, reasoning and problem solving
- Use maths retrieval games/activities to create a 'buzz'
- Know that mistakes are good! Mistakes help us gain knowledge!

Maths Table Pots

Concrete resources are objects or physical resources that children can handle and manipulate to aid their understanding of different mathematical concepts. A mastery teaching approach encourages children of all ages to keep using these concrete resources, in EYFS, KS1 and KS2. While the abstract nature of maths can be confusing for children, through the use of these concrete, practical resources, they are able to 'see' the maths and make sense of what is actually happening.

At Aston Clinton School, every class from Year 1 to Year 6 have access to 'maths table pots'. 'Maths table pots' are available on every table in every classroom and

allow children the opportunity to use a variety of concrete objects to help aid their understanding of different mathematical concepts. The content within the 'maths table pots' differs from year group to year group and are tailored to suit key end points.

Examples of the 'maths table pots' contents:

- Place value counters
- Place value grids
- Base 10
- Ten frames
- Plain counters
- Dice
- Hundred squares
- Number lines

Power Maths Practice Books

Power Maths is aligned with the National Curriculum. It is a whole-class mastery resource that empowers every child to understand and succeed. It develops growth mindsets and encourages hard work, practice and a willingness to see mistakes as learning tools. Best practice consistently shows that mastery of small steps builds a solid foundation of deep mathematical understanding. Children no longer have to simply find the answer to a problem, they are now being asked to explain how they found it. They have to justify, to prove – and then explore alternative ways of solving it, too. As a result, children should become more comfortable with articulating their thoughts and using mathematical vocabulary to do this.

Power Maths makes mastery practical and achievable by providing the structures, pathways, content, tools and support needed to make it happen in every classroom. To develop mastery in maths, children need to be enabled to acquire a deep understanding of maths concepts, structures and procedures, step by step. Complex mathematical concepts are built on simpler conceptual components and when children understand every step in the learning sequence, maths becomes transparent and makes logical sense.

Every child at Aston Clinton School is a mathematician - one of the key aims in maths mastery is for all children to see themselves as mathematicians, and the steady pace and progression of our lessons helps to make that happen. Pupils collaborate together to become independent learners.

Power Maths follows the learning journey of four friendly characters, and they are an inclusive bunch; pupils are able to see themselves represented in the books that they're using.

Aston Clinton's Terrific Times Tables

The National Curriculum expectation for Primary Schools across the UK is that, by the end of Year 4, pupils are capable of recalling all 12 times tables up to 12 x 12.

Children should be encouraged to investigate, see, understand and use the many connections between different multiplication tables. By doing this, they demonstrate true fluency and ultimately reduce the amount of 'facts' they need to store.

At Aston Clinton School, we have created and implemented our very own 'KS1 Terrific Times Tables' and 'KS2 Terrific Times Tables'. Children progress through the KS1/KS2 levels at their own pace. Every week they are given 3 minutes to try and complete the level they are on. If they pass the level, they move onto the next level the following week. If they don't pass the level, they remain on that level the following week. Children are encouraged to use their Times Tables Rock Stars accounts throughout the course of the week to practise!

Key Stage 1			Year 3			Year 4					Year 5 and 6
2x	5x	10x	4x	8 x	3 x	6x	7 x	9 x	11x	12x	Continue to build fluency, and linked facts, including Powers of 10 (e.g. 30 x 40) and decimals in Year 6 (e.g. 0.3 x 3)
[See note below]			(linked to 2 x)	(linked to 2x and 4 x)	(linked to 2x)	(linked to 3 x)	(linked to 6 x)	(linked to 10 x)	(linked to 10 x)	(linked to 10 x and 2 x)	

Terrific Times Tables in Key Stage 1:

In Year 1, children begin the KS1 Terrific Times Tables in the Summer term. Times tables are introduced using the terms 'lots of' and 'groups of' only – there is no use of the multiplication or division symbols.

In Year 2, children are introduced to the multiplication and division symbols (linking their multiplication and division facts).

- Levels 1-5: 2 times tables (terms 'lots of' and 'groups of')
- Levels 6-10: 5 times tables (terms 'lots of' and 'groups of')
- Levels 11-15: 10 times tables (terms 'lots of' and 'groups of')
- Levels 16-20: mixed 2s, 5s and 10s (terms 'lots of' and 'groups of')
- Levels 21-25: 2 times tables (x and ÷ symbols) (x and ÷ facts)
- Levels 26-30: 5 times tables (x and ÷ symbols) (x and ÷ facts)
- Levels 31-35: 10 times tables (x and ÷ symbols) (x and ÷ facts)
- Levels 36-40: mixed 2s, 5s and 10s (x and ÷ symbols) (x and ÷ facts)

Terrific Times Tables in KS2:

- Levels 1-7: 4 times tables (x and ÷ facts)
- Levels 8 -14: 8 times tables (x and ÷ facts)
- Levels 15 - 21: 3 times tables (x and ÷ facts)
- Levels 22 - 23: mixture of 4s, 8s and 3s (x and ÷ facts)
- Levels 24 - 30: 6 times tables (x and ÷ facts)
- Levels 31- 32: mixture of 3s and 6s (x and ÷ facts)
- Levels 33 - 39: 7 times tables (x and ÷ facts)
- Levels 40 - 45: 9 times tables (x and ÷ facts)
- Levels 46 - 48: mixture of 7s and 9s (x and ÷ facts)

- Levels 49 - 55: 11 times tables (x and ÷ facts)
- Levels 56 - 62: 12 times tables (x and ÷ facts)
- Levels 63 - 64: mixture of all times tables up to 12x
- Bronze levels 1-10: squaring and square roots
- Silver levels 1-10: multiplying decimals
- Gold levels 1-10: TBC

Impact:

The exploration of Mathematics at Aston Clinton is interactive and engaging, with content relevant to children's real-world experiences and contextualised thus to support consolidation and retainment of knowledge and skill.

Children approach mathematical study with confidence and enthusiasm, and view tasks and challenges that call for application of varied knowledge across units of work and the selection of multiple skills with self-assuredly and a willingness to collaborate.

Approach and response to reasoning activities will improve term on term, with the expectation that by the end of the year, children are happy to accurately define and use mathematical vocabulary introduced by their teacher.

Teaching and support staff should also see this period of implementation as an opportunity to highlight and further improve concepts that are received well and have clear impact on progress and learning, while also analysing and evaluating practice that needs to be addressed, reviewed or replaced.