

Calculations at Milverton



The aims of this policy

Mastery is for all, and the aim of this policy is to ensure all children leave our Milverton Primary school with a secure understanding of the four operations and can confidently use both written and mental calculation strategies in a range of contexts. It aims to ensure consistent strategies, models and images are used across the school to embed and deepen children's learning and understanding of mathematical concepts. We believe children should be equipped to move between the concrete and the abstract. Children's conceptual understanding and fluency is 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, thus providing the opportunity to make sense of, and develop fluency in the use of, abstract symbols.

How should this policy be used?

This policy has been designed to support the teaching and planning of mathematics in our school. The policy only details the strategies, and teachers must plan opportunities for pupils to apply these; for example, when solving problems, or where opportunities emerge elsewhere in the curriculum. The examples and illustrations are not exhaustive but provide an overall picture of what the mathematics in our school should look like. This is not a scheme of work and must be used in conjunction with White Rose Maths Guidance documents, our Maths Policy document and The National Curriculum Progression Document.

This policy sets out the progression of strategies and written methods which children will be taught as they develop in their understanding of the four operations. Strategies are set out in a Concrete, Pictorial, Abstract (CPA) approach to develop children's deep understanding and mastery of mathematical concepts. Children use concrete objects to help them make sense of the concept or problem; this could be anything from real or plastic fruit, to straws, counters or cubes. This is then developed through the use of images, models and children's own pictorial representations before moving on to the abstract mathematics. Children will travel along this continuum again and again, often revisiting previous stages when a concept is extended. It is also worth noting that if a child has moved on from the concrete to the pictorial, it does not mean that the concrete cannot be used alongside the pictorial. Or if a child is working in the abstract, 'proving' something or 'working out' could involve use of the concrete or pictorial.

Similarly, although the strategies are taught in a progressive sequence, they are designed to equip children with a 'tool box' of skills and strategies that they can apply to solve problems in a range of contexts. So as a new strategy is taught it does not necessarily supersede the previous, but builds on prior learning to enable children to have a variety of tools to select from. As children become increasingly independent, they will be able to and must be encouraged to select those strategies which are most efficient for the task. The strategies are separated into the 4 operations for ease of reference.

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However, it is intended that addition and subtraction, and multiplication and division will be taught together to ensure that children are making connections and seeing relationships in their mathematics. Therefore, some strategies will be taught simultaneously, for example, counting on (addition) and counting back (subtraction).

Milverton expects children to use correct mathematical terminology and to express their reasoning in complete sentences. The quality of children's mathematical reasoning and conceptual understanding is significantly enhanced if they are consistently expected to use correct mathematical terminology (e.g. saying 'digit' rather than 'number') and to explain their mathematical thinking in complete sentences. This is further supported by this document as it provides examples of mathematical vocabulary to be used when teaching each operation.

Multiplication and Division Facts

Times Tables are at the heart of mental arithmetic. Once the children have learnt their times tables by heart, they are then able to work far more confidently - and efficiently- through a wide range of more advanced calculations. Milverton KIRFS reflect the progressive teaching and recall of multiplication from Year 1 to 6. Year 4 children will complete the statutory Government national online test. Weekly 'Quizzes' to support children with their understanding are routine from year 3.

Overview

Year 2	recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables
Year 3	recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables
Year 4	recall multiplication and division facts for multiplication tables up to 12×12
Year 5 and 6	Regular consolidation of all times tables

We learn the tables in this order:

x10	x5	x2	x4	x8	x3	x6	x9	x7	x11	x12
Year 2			Year 3			Year 4				

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