



Blessed Robert Widmerpool Catholic Voluntary Academy

Calculations Policy

Mathematics - "... the seal of perfection, full of wisdom and perfect in beauty."
Ezekial 28:12

This policy outlines how mental and written calculations in all four operations are taught throughout the school, based on the National Curriculum in England 2014. It is a working, adaptable guide that is regularly evaluated and reviewed; a product of a whole school approach using consultation and discussion between all teaching staff and management. Any changes are thus rolled out to Teaching Assistants by class teachers. This establishes continuity, consistency and progression in calculations through the school. Teachers should be aware that this policy is to be used alongside the National Curriculum Programme of Study and the White Rose Scheme of Work as starting points to ensure that children are given the opportunities to meet and exceed statutory requirements.

Please note that early learning in calculation in Foundation Stage follows the 'Development Matters EYFS 2012' document, and this calculation policy is designed to build on progressively from the content and methods established in the Early Years Foundation Stage.

INTENT

The purpose of this policy is to ensure the following:

- Addition and subtraction facts and multiplication and their corresponding division facts are secure
- Mental and written calculations in mathematics at BRW build learning power in pupils
- Calculation methods and strategies lead to secure and varied fluency
- Secure fluency enables accurate reasoning and problem-solving
- Children as a result of the above intent, 'master' mathematics
- Children become confident in selecting the most efficient strategies to solve unfamiliar problems.

IMPLEMENTATION

(See extended calculation policy on the server alongside the below)

To achieve our intent, the school and its calculations policy place great emphasis on the importance of:

- fluency in both mental and written calculations, with the understanding that mental fluency is at the heart of successful calculation.
- mathematical talk and reasoning
- relational understanding, making connections and generalisations between the concrete and the abstract; images, words, symbols and action objects.
- the 5 Rs in maths: resilience, resourcefulness, reflectiveness, responsibility and relationships.
- learning in a problem-solving context.

There is an expectation of all pupils that they should firstly consider if calculation can be completed successfully with mental approach. Paper and pen procedures should be used second to mental calculation. The first two questions any child should consider is: *what is the best method to use for this problem? Why?*

At all stages, children should be encouraged and expected to approximate the size of their answers, calculate and then check. This should become a natural step in *any* calculation.

The majority of pupils will progress through the calculation methods at broadly the same pace, but pupils should be given enough chances to master fluency in their own time. The decision about when to move on to new methods will depend on the security of pupils' understanding.

If understanding of a calculation is grasped in depth (conceptual and procedural → fluency) then the expectation is that pupils are challenged with reasoning and rich, open problem-solving opportunities within that concept to allow a broadening and deepening of content, before being accelerated onto the new content.

For pupils who are not sufficiently fluent in a stage of calculation, the expectation is that they are given opportunities to master concepts at their pace through further practise, before progressing. The question of when to 'progress' pupils ultimately rests upon the assessment of the teacher.

With all this in mind, every child should be given the opportunity to reason and problem-solve in all lessons. These reasoning and problem-solving tasks are differentiated to suit the child's level of fluency.

All of this should be undertaken in a rich and sophisticated problem-solving environment where planned-repetition features regularly to ensure concepts become embedded and committed to long-term memory.

IMPACT

- Key Stage One

By the end of Key Stage One, pupils are expected to have developed mental calculation fluency and early written calculation procedures with whole numbers, counting and place value, using numerals, words and all four operations supported by practical apparatus, images and digital technology. They should know all number bonds to 20 and show precise understanding of place value as well as use regular practise with mental calculations and objects to help them achieve this. Multiplication facts and their corresponding division facts for the 2s, 5s and 10s should be understood conceptually and memorised to enable rapid recall.

- Lower Key Stage Two

By the end of lower Key Stage Two, pupils are expected to have become increasingly fluent in calculation methods involving whole numbers and the four operations. Secure knowledge and understanding of number facts and place value is a key part of this. Pupils should develop efficient formal and informal written and mental methods to perform calculation accurately with increasingly large whole numbers, as well as simple fractions and decimals. Mental methods should still take priority and be honed first before exclusive use of written methods, though both types of calculation should be seen as complementary. Pupils should still be supported by practical apparatus, images and digital technology. Multiplication facts and their corresponding division facts to at least 12x12 and number bonds to 100 should be understood conceptually and memorised to enable rapid recall.

- Upper Key Stage Two

By the end of upper Key Stage Two, pupils should have extended their understanding of calculations in the number system as well as place value to include larger integers. Connections between multiplication and division calculations should be made, including fractions, decimals, percentage and ratio. They develop efficient mental and written calculation methods to solve a range of more demanding problems. Mental methods should still take priority and be honed first before exclusive use of written methods. When faced with problems, children should consider the value of mental calculations before written, however, they should also be seen as complementary. Algebraic calculations should also be developed in pupils. Pupils should still be supported by practical apparatus, images and digital technology. Ultimately, children should leave with fluency in all four operations in terms of mental and written calculations. This includes long multiplication and division as well as fractions, decimals and percentages.

Policy to be reviewed September 2023