



Villa Real School
together we achieve

Maths Policy 2022

Responsibility: J.Wickham

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Signed and Adopted by the Governing Body:

Chair of Governors

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INTRODUCTION

This document is a statement of principles, aims and strategies for the teaching of Numeracy/Mathematics at Villa Real School.

The development of Mathematics is seen as a crucial core entitlement for all pupils and students within Villa Real School, from 2 – 19 years.

The core aims for teaching Mathematics at Villa Real are in line with the 3 main aims of the National Curriculum to ensure children:

- Become **fluent** in the fundamentals of Mathematics
- **Reason Mathematically**
- Can **solve problems** by applying their mathematic skills to a variety of routine and non-routine problems.

Villa Real has adopted the **Mastery Approach** to teaching Mathematics. The essential idea behind mastery is that 'all pupils need a deep understanding of mathematics so that:

- Future mathematics learning is built on solid foundations which do not need to be re taught
- Teaching is focussed, rigorous and thorough to ensure learning is embedded and sustainable over time.
- Challenge is provided by deeper learning rather than speeding through the curriculum
- Build on their awareness of events and actions and recognise changes in pattern, quantity and space that occur in their lives, both the immediate environment and in the wider world
- Use their developing awareness to anticipate and predict changes
- Use their awareness and developing understanding of pattern, space, shape and number, to develop problem-solving skills that contribute to making choices, taking decisions and gaining control over their immediate environment
- Extend mathematical skills, experiences and understanding which enable them to visualise, compare and estimate. For 'more able' pupils this may be achieved in abstract as well as concrete contexts
- Begin to think about the strategies they use and explain them to others
- Develop a powerful set of thinking tools to help them increase their knowledge and understanding of the world and, during the school years, to learn effectively in different subjects across the curriculum

AIMS

The overarching aim for Mathematics at Villa Real School is to promote high standards of numeracy by equipping pupils with the very best knowledge and understanding so they can make sense of the world by developing their ability to calculate, to reason and to solve problems. It enables pupils/students to understand and appreciate relationships and pattern in both number and space and in their everyday lives.

Our ambitious Mathematics curriculum is progressive and sequenced, building on prior knowledge whilst learners revisit and recall prior vocabulary, skills and understanding. Component knowledge is built on so composite knowledge is acquired. Mathematical vocabulary is taught, revisited and memorised.

Numeracy or Mathematics lessons aim to encourage all learners from EYFS to Key Stage 5 to develop mathematical skills so they can:

- Become fluent in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils/students develop conceptual understanding and the ability to recall automatically and apply knowledge accurately
- Reason mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language
- Solve problems by applying their mathematics to a variety of routine and non-routine problems, including breaking down problems into a series of simpler steps and persevering in seeking solutions

These skills are integral to the development of our learners Mathematics or Numeracy however also factor heavily across all areas of the whole school curriculum.

We aim to develop the learners' love of Mathematics/Numeracy by creating engaging fun experiences, which build self-confidence and independence. The School believes that the aim of the Numeracy/Mathematics curriculum is to enable each learner to develop their full potential. Mathematics teaches us how to make sense of the world around us by developing a child's ability to calculate, to reason and to solve problems. It enables children to understand and appreciate relationships and pattern in both number and space in their everyday lives.

Through an embedded **CPA Approach** (concrete, pictorial, abstract) to the modelling of new concepts, we aim to increase confidence in mathematics, enabling all pupils to achieve regardless of their starting points. We aim to develop good understanding of numbers and the number system, whilst teaching pupils to apply this knowledge through problem solving and real-life activities. The teaching of mathematics should include the use of manipulatives, particularly Numicon and real life objects, to develop reasoning skills and opportunities to use specific mathematical vocabulary and a culture of enthusiasm and wonder while developing a love of the subject.

Opportunities to develop the ability to reason and problem solving should be evident through planning and teaching, exploring links between core arithmetic skills. Children should be encouraged to make connections between mathematics as well as other subject areas such as Science, Geography, Design Technology and Outdoor Learning.

The Villa Real Calculation Policy supports the development of learners as well as supporting the professional development of school staff.

SCOPE

This policy applies equally to all learners in the school, with full consideration being given to each individual's specific needs in relation to the development of Numeracy/Mathematics.

As part of that process, advice and guidance is sought, where appropriate, from other professionals working in school – including speech and language therapists, occupational therapists, physiotherapists, educational psychologists and teachers specialising in the education of pupils and students with multiple disabilities and multisensory impairment or complex and multiple learning difficulties. Teaching staff expertise is also shared and relevant training is undertaken and disseminated to other staff.

PURPOSE OF STUDY

Mathematics is an interconnected subject through which pupils need to be able to move fluently. This includes between key mathematical concepts as well as a range of representations of mathematical ideas. The programmes of study are split into specific strands of mathematics in order to teach clear concepts but definite connections across all mathematical ideas must be made.

ENTITLEMENT

Our ambitious curriculum begins in EYFS where pupils follow the Villa Real Early Years Framework. Numeracy is taught in Key Stage One and until the end of Key Stage 2 and then Mathematics in Key Stages 3,4 and 5. The curriculum is mapped and sequenced across the whole school, through the different mathematical strands which are:

- Number – place value, addition, subtraction, multiplication, division and fractions
- Geometry – 2D and 3D shape, position and direction
- Measure – length, mass, volume, capacity and time
- Statistics and Probability – data handling (graphs, charts and tables) and probability

Early maths skills are stringently and carefully taught throughout the school, not depending on age, but depending on the development of the learner.

Every class will have Numeracy/Maths every day. Class managers create plans to ensure that opportunities are engaging and developmental for all learners, ensuring individual pupils/students' needs are met, keeping in mind the end of key stage goals set by the school and including any links appropriate with other subject areas.

Sessions are delivered by various members of staff who will have the relevant subject knowledge to support the learners on their learning journey.

All classes follow the White Rose Scheme of Work or Villa Real Sensory Maths Schemes of Work depending on which pathway they are on. These robust and ambitious curriculums are based on the National Curriculum and New Early Years Framework which have been adapted in a bespoke and individualised way. Planning extends beyond the National Curriculum to meet the needs of our pupils/students.

- Pathway 1 – pupils follow the VR EYFS Framework based on the EYFS Statutory Framework
- Pathway 2 – pupils/students follow the VR Mathematics Sensory Scheme of Work based on the National Curriculum, delivered in a multi-sensory way. Assessment may be via the Engagement Model
- Pathway 3 – Pupils/students follow the White Rose Scheme of Work. In Key Stage 1 and 2 the pupils work towards the pre-key stage standards and National Curriculum SAT's. In Key Stages 3,4 and 5 students work towards AQA Entry Level Mathematics. Students who are ready, sit AQA Entry Level 1/2/3 exams when appropriate from year 9 as part of a sequenced personalised curriculum. For those pupils who are ready, preparation work for GCSE Mathematics will be delivered.

Classes follow the school overview to ensure coverage and use different strategies to support their learners. Numicon is used throughout the school to develop the pupils/students understanding of number and place value. All classes will include a number/counting activity daily and develop skills in recall and the comprehension of key vocabulary. The key vocabulary for each area and level of learning is set out the in National Curriculum, the school's Calculation Policy and Schemes of Work.

MORE ABLE

Learners who have been identified as More Able will have specific strategies and interventions appropriately planned by the class manager and overseen by Senior Management to ensure that their specific needs are met.

ORGANISATION

Each class should have a 'working wall' designed, displayed and used depending on the need of the learners in their class. The learning journey for that unit of work should be clearly visible on it. The work on the display should consist of the strand covered and key vocabulary and could include; examples of modelling, prior knowledge, good examples of learning, or links to other areas of the mathematics curriculum.

All classes should teach at least 3 sessions on Numeracy/Mathematics per week. This work should be recorded in books. Daily opportunities for counting, using number or other /numeracy maths skills across the curriculum should be considered when planning and teaching.

The School intends to provide the resources and opportunities for training necessary for teaching and non-teaching staff, maths specialists and non specialists to put the policy into practice.

School based Inset time will be used to:

- Facilitate the standardisation and moderation of assessment and recording procedures
- Share and develop teaching strategies and skills
- Familiarise staff with available teaching resources

Curriculum guidelines will accompany this policy to indicate the means by which the aims are put into effect and the requirements/expectations met.

In the classroom we seek to create a supportive learning environment. We make great use of a variety of age related software, websites, games and real-life materials to engage students and help them learn in the way that best suits their needs with an emphasis on the key skills of Problem Solving.

Perception

- recognising opportunities
- recognising and identifying problems

Thinking

- breaking down a problem into elements
- thinking through the relevant features of a problem
- planning ways to solve a problem

Action

- remembering how to solve a problem

Evaluation

- evaluating how a plan worked
- recognising when existing plans and strategies need changes

PLANNING

Medium Term Plans should be created in the 'Villa Real MTPlan Format' for each term and should include the key outcomes for each pupil/student in the class. Information regarding the learning objectives, key questions, the strands of mathematics covered, the organisation of the coverage, key vocabulary, teaching strategies, manipulatives and assessment plans should

be present and clear. These are working documents so can be altered and re arranged to meet the needs of the pupils. Plans are submitted termly to the Maths Subject Leader, Headteacher and Key Stage Managers to quality assure.

Key vocabulary for teaching Numeracy/Mathematics is not ragged. Due to the vast amount of key vocabulary across all strands, vocabulary is organised in the different units of work either in the Villa Real Sensory Scheme of Work, the White Rose Scheme of Work. These words can then be used to produce the bespoke planning for individuals depending on their development and the small steps of progress being planned and delivered.

Class Teachers can decide on how they wish to organise the curriculum for maths within their classes, depending on what strategy will encourage deeper learning for the needs of the individuals of the class. For example, teachers may choose to block Maths in topics such as Length for 2 weeks, then Addition for 2 weeks etc. Or they may choose to teach a different strand each lesson, for example Measure on a Monday, Calculation on a Tuesday etc. However, each class must cover an element of Number every day and there must be a problem solving activity each week. Reasoning and fluency must be present throughout.

It is the class teacher's responsibility to ensure pupils gain a varied mix of mathematical learning and all the strands are covered within the year.

Formal lessons can consist of a Mental Oral Starter during which the focus should predominantly be on number skills and counting. This should then be followed by focussed input, then independent or supported activities and then a plenary, either whole group or individual, at the end of the lesson. This is a good time to either pre teach for tomorrows learning, carry out an elicitation for next steps or assess understanding from that session. The Teaching Style adapted reflects the School's Teaching and Learning Policy.

ASSESSMENT

Formative assessment must take place throughout all lessons, and tasks should be changed throughout the lesson to meet the needs of the learner in necessary. The marking guidance set out in the Marking Policy must be followed when assessing children's learning through their work. Where misconceptions have occurred, and it is not appropriate to address this within the lesson, an opportunity to revisit the learning must be given. This could be included in the morning work the next day, or provided by a different activity for the following day's lesson.

For those pupils/students accessing Numeracy/Mathematics skills across the Engagement Steps on B Squared. Mathematics progress and assessment in covered within the 'Cognition and Learning' section, mostly under 'Curiosity',

'Investigation' and 'Discovery'. B Squared captures this data to create reports.

For those pupils/students accessing Mathematics skills across the Progression Steps on B Squared. B Squared groups objectives into 'Number', 'Geometry and Measure', and 'Statistics and Probability' to capture data reports.

Teachers assess across all strands in Mathematics, and these must be entered onto B Squared as outlined in the Assessment Policy.

TARGETS

For Mathematics there are two different types of formal targets set for each individual pupil.

End of year targets for Mathematics are set using the data captured on B Squared and set in line with the Assessment Policy.

REAL targets for individual pupils may have a Numeracy/Mathematics linked target set as their 'Learning and Curriculum' target or as part of the 'Employability' section in their Education Health Care Plans.

MONITORING AND EVALUATION

Quality assurance of the teaching and learning of Mathematics will take place through focussed book scrutinies, pupil voice, evaluation of Medium Term Plans, lesson plans, learning walks, and data analysis.

Feedback will be given to staff following any monitoring activity, through written and verbal means, and the opportunity for discussion will always take place. Where an area for development is identified, as a whole school or in a particular class or year group, support will be given by the Maths Subject Leader, member of the MMT or SLT or other specified teacher.

USE OF ICT

Calculators should not be used as a substitute for good written and mental arithmetic. They could be introduced in KS3, 4 or 5 to support pupils' conceptual understanding and exploration of more complex number problems. They may also be used to support reasoning.

Teachers should use their own judgement as to when ICT tools should be used in teaching and learning. It is essential that the use of IT does not take the place of concrete exploration of ideas, using manipulatives or jottings. It

must not be over used in the classroom and it should be carefully considered as the when it supports the children's learning best.

SPOKEN LANGUAGE/ORACY

As cited in the National Curriculum, the importance of spoken language in developing pupils' mathematical understanding is of great importance. Even though verbal communication is an area where many of the pupils at Villa Real are at a disadvantage, the quality and variety of language that the children hear and speak are key factors in developing mathematical vocabulary and an ability to present mathematical justification, argument or proof. Staff must use and introduce the correct mathematical vocabulary, showing how to use the words on their own and to model good examples of reasoning. This appropriate vocabulary must also be available on symbols for PECS, Makaton, Eye gaze software, PODD or any other communication means our pupils require. Pupils must be supported in making their thinking clear to themselves as well as others, and discussion with manipulatives alongside, should always be used to probe and assist in addressing their misconceptions.

Teachers are encouraged to use Maths games and opportunities where learners can communicate with each other to embed learning and revisit and recall previously taught information.

HOMEWORK

Homework is set in accordance with the Homework Policy. Homework should include a variety of activities to support learning.

REMOTE LEARNING

If learning cannot happen on site, class managers will follow the guidance outlined in the Numeracy/Mathematics Remote Learning document.

RESOURCES

Every classroom should be well equipped with a range of core manipulatives. These should be suitable for visually representing known strategies, modelling new concepts and for children to use to support the calculation and verbalising their thinking. Manipulatives and visual representations should be used throughout every lesson to support the children's reasoning skills and ability to justify their theories.

Other manipulatives which are not used as regularly, such as those for measure, are to be centralised and should be put back when they are no longer being used, so that other classes can take advantage of them.

Should a member of staff feel they need more resources, they should check with other classes first, to see if they have any spare, and only if none available should source the resources, fill out an order form from the office and give this to the Maths subject leader.

Each classroom should adopt a culture of positive manipulative use. Pupils should feel positive about using manipulatives to help them and staff should encourage the use of manipulatives when asking children to explain their ideas.

Villa Real uses a variety of published materials to facilitate the teaching of mathematics such as White Rose and Numicon, but recognises the need for the teaching of maths to be 'scheme assisted not scheme driven'.