MVFS Maths Curriculum

Meadow View Farm School
excellence as standard

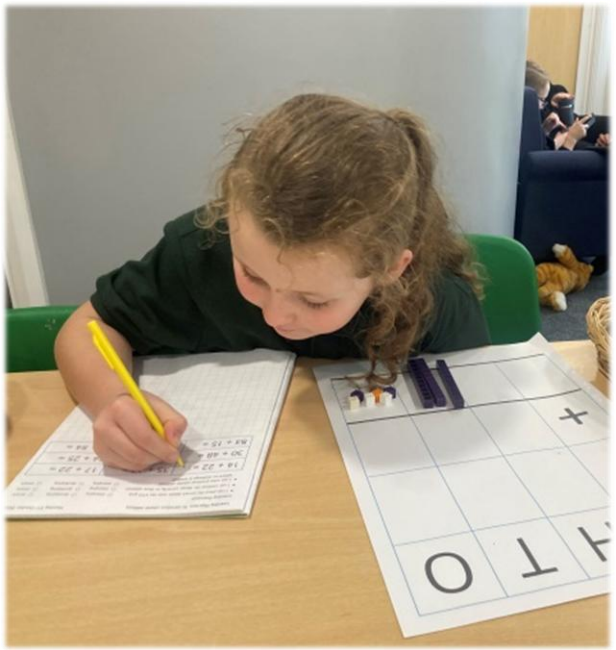
Intent

At MVFS we agree with the National Curriculum that maths *"is essential to everyday life, critical to science, technology and engineering and necessary for financial literacy and most forms of employment."* As such, we are dedicated to developing the mathematical knowledge and skills of all of our children, and to helping them to recognise the opportunities that being confident and capable with maths will provide them. Due to their complex needs/backgrounds and their experiences in previous settings, almost all of our children arrive at MVFS with significant gaps or delays in their acquisition of fundamental maths skills; including fluency, reasoning and problem solving. As a sound knowledge of maths is essential for many everyday tasks and for learning in many other curriculum areas, we recognise that this puts our children at a disadvantage. It can also have a grave impact upon their mental health and wellbeing; and can limit their future life chances – putting them at risk of being effectively disenfranchised and excluded from many forms of future employment. As such, we are passionate about and committed to helping all of our children to overcome barriers, develop positive attitudes and start believing in themselves.

We believe that, by considering the needs of our children (both in the moment and the future), our carefully sequenced maths curriculum and nurturing approach raises aspirations and enables our children to feel safe and take risks with their learning as we work together to reframe adverse past experiences and take positive steps forward.

Our Key Aims: At MVFS, we strive to…

- support our children to develop confidence and mental fluency with numbers (including counting, place value, and operations) and make connections between mathematical concepts.
- develop a deep and interconnected understanding of mathematical concepts and procedures, focusing on understanding the 'why' behind the methods, not just memorising facts.
- develop logical thinking and the ability to follow a line of enquiry: conjecturing, generalising, and justifying mathematical ideas using appropriate mathematical language.
- enable our children to apply mathematical knowledge to solve a variety of problems; including breaking down complex problems into simpler steps and persevering in finding solutions, and applying mathematical understanding to real-life situations.
- develop a positive attitude and a mindset towards mathematics; building resilience and perseverance through carefully considered challenge and supported reflection.



Implementation: Our Ethos and Approach

In every class at MVFS we have children from a wide range of previous schools and settings; each of which has given them a different start in their educational journey. Our commitment to placing children based on the needs of the whole child (rather than simply grouping children according to their chronological age) also means that we can have classes with a considerable mix of ages. It is, therefore, essential that our teachers implement our maths curriculum in a way that is flexible enough to meet a wide range of needs and empower all children to make progress, whatever their starting point.

As a school, we are guided by the schemes of learning developed by White Rose Maths [WRM]. A key aim of WRM is to be inclusive for all pupils and, at MVFS, we embrace their motto *'Maths: Everyone Can'*. At each stage, the WRM schemes of learning fully cover the aims and content of the National Curriculum, and are designed to support the development of reasoning and problem solving alongside fluency; and to encourage appropriate challenge and ambition for all children. We are confident that we know our individual children (and their needs) well enough to define and demonstrate what is ambitious for each individual; and WRM's small steps structure, progression documents and assessments help us to identify gaps and put a range of measures in place to help children be successful and meet their goals.

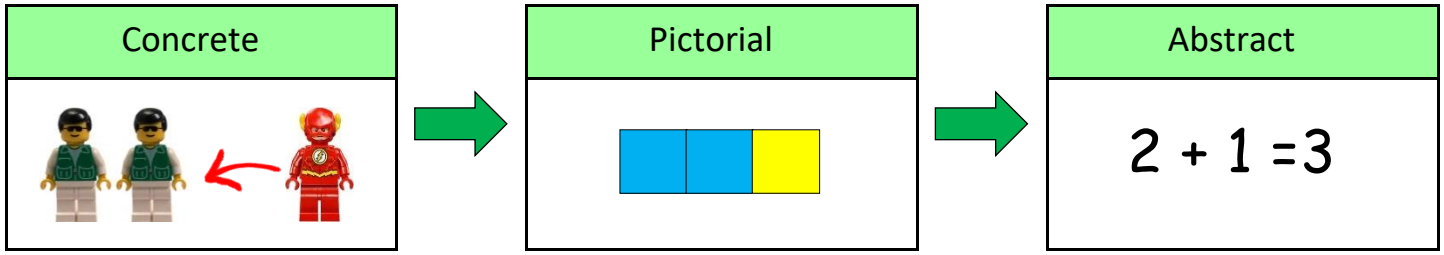
Implementation: Sequencing, Revising and Reminding

- The fundamental idea behind our curriculum design is to support pupils to be able to first perform simple mathematical tasks with sound understanding and efficiency, so they can then move on to tackle and succeed with more complex tasks. This thinking gives rise to the WRM sequence of 'blocks' of mathematics; each of which is broken into small steps which are again sequenced in order of difficulty and dependency. Nothing is left to chance – each step builds carefully from the previous step, building on children's prior knowledge to develop new skills.
- The approach taken by WRM aims to "*combine the best of both 'mastery' and 'spiral' approaches in our curriculum.*" It follows the mastery principles of spending longer on topics to help gain deeper understanding, but also recognises that just spending a good chunk of time on a topic doesn't mean that all children will 'master' it the first time they see it. Indeed, they need to see it again and again in different contexts and in different years to help them truly develop their understanding. Hence, the WRM schemes of learning promote the revisiting and reinforcing features of spiral curricula too.
- The WRM schemes of learning have number at their heart, and a significant amount of time is spent reinforcing number in order to build competency and to ensure that children can confidently access the rest of the maths curriculum (e.g. many aspects of the key stage two measures curriculum cannot not be understood fully until children have a sound grasp of place value and decimal numbers).
- Fluency, reasoning and problem solving are integrated into classroom practice in the order that is appropriate for the step; e.g. division may be introduced by a problem about sharing or grouping, for which children need to be able to reason and become fluent at the relevant procedures.

Implementation: Structures and Representations

- Mathematical structures are the key patterns that underpin sets of numbers – they are the rules and relationships that we want children to notice; and we use different representations to help our children to *'see the maths'*.
- To facilitate this, we follow a Concrete → Pictorial → Abstract' approach in all areas of maths; and our classes use a range of equipment, representations and manipulatives to help the children explore numbers, procedures and patterns.
- This means that, each time a new concept is introduced, children have the opportunity to explore and get 'hands-on' experience by handling, moving and combining actual objects (concrete representations). The next step in their learning replaces actual objects with pictures – here the children can no longer move or manipulate the objects, but they can still 'see' what is happening (pictorial representations). The final step in this process takes the children away from pictures and replaces them with symbols (abstract representations).

An example using this approach for adding:



- To enable our children develop a broad and deep understanding of the maths studied, and to ensure that they do not become overly dependent on a particular representation, we make sure that they encounter lots of variation within each area of study.
- Procedural variation (deliberately changing the type of examples used and questions set) is used to draw attention to certain features; whilst conceptual variation (when a concept is presented in different ways) demonstrates a particular concept in all of its different forms.

Implementation: Planning for Misconceptions

- The EEF defines a misconception as a misunderstanding that leads to a systematic pattern of errors. [Improving Mathematics in KS2 and KS3] At MVFS, we recognise that simply telling our children why something is wrong will not have the best impact on developing their conceptual understanding. Instead, we encourage our children to actively think and explore the learning taking place (arguably, even more so if we are addressing a misconception that is grounded in what a child believes to be accurate knowledge).

- With this in mind, the WRM schemes of learning, resources and activities include many questions and investigations which challenge children to spot, explain and rectify errors. Our children's responses to these tasks help teachers to identify and tackle misunderstandings early on, rather than letting incorrect ideas become established.
- By outlining what children ought to be able to do at the end of each lesson and by signposting common barriers and misconceptions, the WRM schemes of learning enables our teachers to prepare for (and deal effectively with) inaccurate responses in the classroom. Indeed, by exploring possible misconceptions at the planning stage, teachers can pre-empt the stumbling blocks that our children might face and address them from the beginning of the lesson – rather than reacting during or after a task.
- Not only does this pre-emptive approach enable us to facilitate deeper mathematical understanding in our children, it also enables us to carefully manage an appropriate level of challenge and risk in their learning. At MVFS we want all of our children to develop resilience as learners and to recognise that making errors is an inevitable part of learning – and often a stepping stone to greater understanding.
- For many of our children, their past life experiences (within and beyond education) have resulted in them having fragile self-esteem and they are quick to feel shame and a sense of being overwhelmed when they begin to feel 'stuck' on a task. In their previous settings, this often led to our children becoming disengaged (resigning themselves to the 'fact' that they are not clever enough to succeed) or becoming disruptive and attempting to sabotage the lesson (an attempt to take back control when faced with a feeling of helplessness). Exploring misconceptions together and reframing errors as opportunities to explore and develop our knowledge, means that, over time, our children develop the confidence and understanding to become increasingly independent and resilient in their learning.

Impact

Our unwavering commitment to improving outcomes for our children, combined with our positive and inclusive approach to teaching maths, enables them to overcome negative experiences and leave MVFS believing that they are capable of success in maths. Similarly, our focus on nurturing the whole child enables them to develop positive behaviours for learning – they are able to recognise and celebrate their progress, build resilience to accept and manage setbacks, and no longer feel the need to disrupt or sabotage learning for themselves or others.

This marks the start of a journey that has the power to reframe their experiences and attributes in a positive way, and to significantly improve their life chances and outcomes; as our children are able to transfer the knowledge, skills and confidence that they learn in maths lessons across the curriculum, and to life outside of school.