Approach to Early Maths at Malvern Parish

(informed by EEF (2021) Improving Mathematics in the Early Years and Key Stage 1)

At Malvern Parish, we understand that Mathematics plays a key role in a child's development. Developing a sound understanding of maths when we are young is essential. If children have a good early mathematical understanding, they are more likely to do better later in school. It is also connected to their educational progress, and life outcomes. Very young children are naturally curious, noticing differences in quantity and the shape of objects. They use early mathematical concepts when they play. Mathematical understanding helps children make sense of the world around them, interpret situations, and solve problems in everyday life. This could be talking about objects, sharing amounts with their peers, or counting in play.

How do children's maths skills develop?

Mathematical development involves acquiring skills, understanding concepts, and gaining factual knowledge across a range of topic areas. These include topics such as quantity and number, operations, shape, and space. It also involves forming connections between concepts. An example is connecting the numeral '3' with three objects. Children also need to develop reasoning skills such as logical thinking and the ability to predict and communicate their ideas.

A large amount of research on how children learn maths has revealed how complex it is. The rate of mathematical development relies on specific mathematical knowledge and other skills. These include:

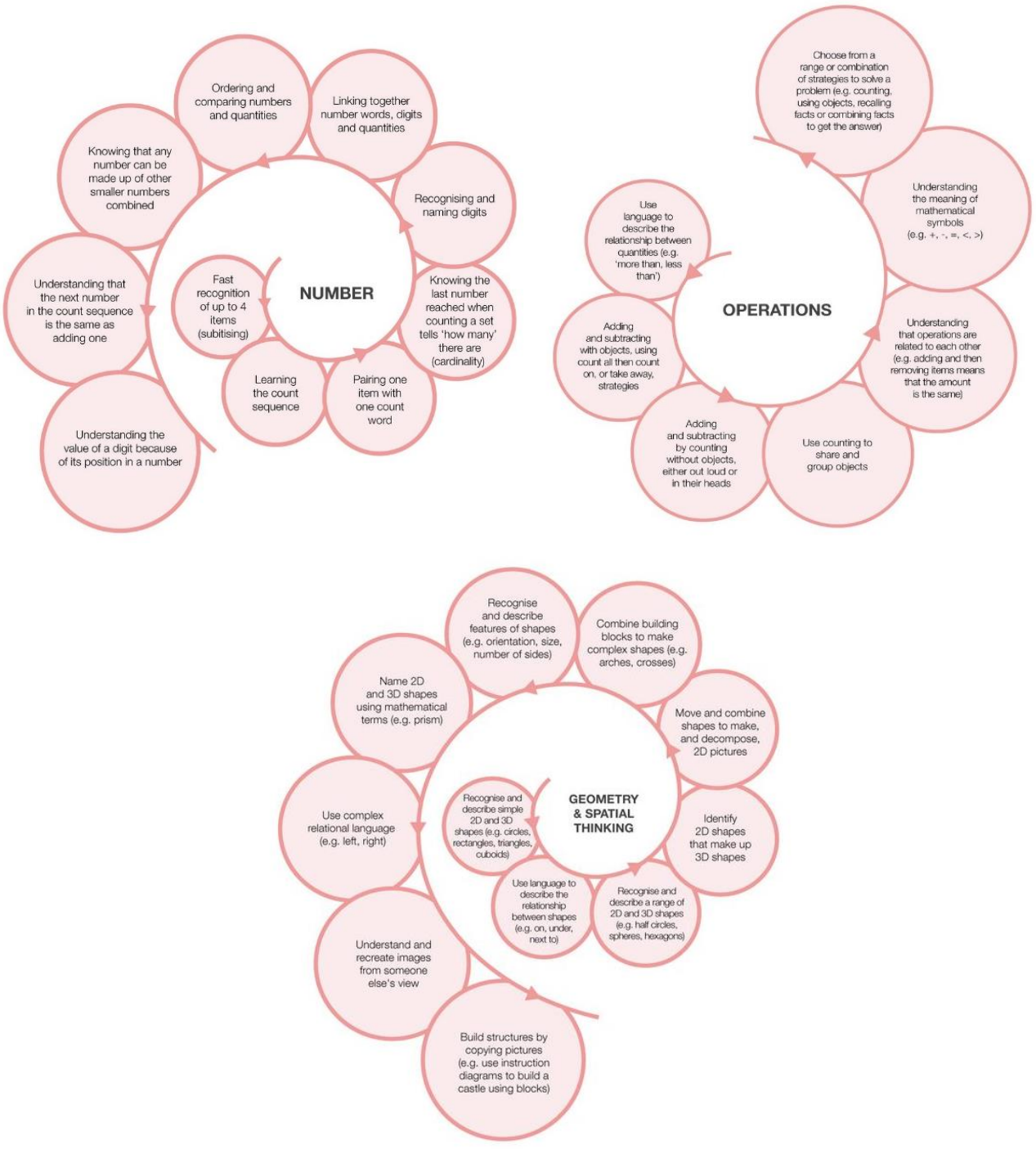
- executive functions – such as working memory, which is the ability to hold information in your mind and manipulate it;
- language and motor skills;
- children's prior mathematical experiences; and
- children's interests, enjoyment, and attitudes towards maths.

Developing a secure grasp of early mathematical ideas takes time. Even if a child appears to be engaging successfully in mathematical activities they may not have a full grasp of the underlying concepts. For example, they might be able to say the count sequence correctly but not understand the meaning of numbers within it. Children may also appear to have grasped an idea in one context but then not show that knowledge in a different context. There are different possible paths that children may follow in developing an understanding of a mathematical topic. 'Developmental progressions' are descriptions of the usual path that children follow in developing such an understanding.

Mathematical developmental progressions

The spirals below are examples of how children's maths develops in different topics. They highlight how individual skills or concepts develop over time. While there is generally an order in which these skills may emerge, development does not take place in clearly defined linear steps. Some children may develop several skills at the same time. Other children may learn skills in different orders. This is why the diagrams are a spiral. To reach full understanding, children will need to master each of these skills. While each spiral is a separate diagram, there is considerable overlap across the topics.

Understanding how mathematical concepts typically progress can help educators understand what children need to learn next. It also helps them to build on what children already know. Then educators can expose children to a range of experiences so they can gain a full understanding of mathematical topics



Our approach to teaching Early Maths takes into account key recommendations from the EEF (2021) report *Improving Mathematics in the Early Years and Key Stage 1*.

1. **Develop practitioners' understand of how children learn mathematics**

Professional development is used to raise the quality of practitioner's knowledge of mathematics, of children's mathematical development and of effective mathematical pedagogy. The Maths Lead receives regular CPD through DOWMAT and GLOWMaths Hub groups which is then fed back to staff through CPD meetings. Staff in EYFS have received specific training on supporting mathematical development in Early Years. Practitioners are aware that developing a secure grasp of early mathematical ideas takes time, and specific skills may emerge in different orders. Adults in all areas of the classroom will model mathematical language and use questioning to deepen the children's understanding and enhance their learning.

2. **Dedicate time for children to learn mathematics and integrate mathematics throughout the day**

In EYFS, Mathematics is developed through purposeful, play-based experiences and will be represented throughout the indoor and outdoor provision. The learning will be based on children's interests or current themes and will focus on the expectations in Number and Numerical Patterns from the Statutory Framework for the Early Years Foundation Stage. As the children progress through, we aim for children to gain a deeper understanding of the number system with a key focus on numbers to 10 in preparation for KS1. As the children make progress towards the Early Learning Goal, they have opportunities to demonstrate their mastery skills in a range of appropriate activities both inside and outside of the classroom. Mathematics is explored through different contexts, including storybooks, puzzles, songs, rhymes, puppet play, and games.

In Y1 and Y2, children receive a daily Maths lesson and up to three additional fluency sessions each week to revisit and consolidate skills. Practise and consolidation play a central role to mathematics learning. We understand the importance of ensuring children regularly retrieve previous learning to ensure learning is not 'forgotten'. Daily maths lessons are supplemented by regular fluency sessions that are designed to reinforce and provide regular practice in the basic skills. Fluency in maths is often linked to number sense and calculations. When children are fluent they are able to calculate accurately and efficiently and be flexible in their choice of strategies. They feel confident in working with numbers and can explain their thinking and apply their understanding in different contexts.

In Key Stage 1, teachers use the White Rose Education Fluency Bee programme to revisit and secure knowledge from prior year groups outside of the maths lesson. In 15 minute daily sessions, all pupils revisit the fundamentals of number sense and mathematical fluency through frequent practise, the use of key representations and concrete resources to support conceptual understanding and exposure to mathematical talk.

3. **Use manipulatives and representations to develop understanding**

Manipulatives and representations are powerful tools for supporting young children to engage with mathematical ideas. At Malvern Parish, we ensure children understand the links between the manipulatives and the mathematical ideas they represent. Teaching staff ensure that there is a clear rationale for using a particular manipulative or representation to teach a specific mathematical concept. Children are encouraged to represent problems in their own way, for example with drawings and marks. Manipulatives and representations are used to encourage discussion about mathematics. EYFS and KS1 will use consistent manipulatives and representations such as rekenreks, bead strings, part-part wholes, sorting hoops, counters (including place value counters), base 10 (or dienes), number lines and tens frames.

4. Ensure that teaching builds on what children already know

At Malvern Parish, we have adopted a mastery approach to maths teaching, where the belief is that all children can achieve. Quality first teaching is vital. Sequences of lessons are planned using the White Rose schemes of learning, though there is still flexibility for teachers to use their professional judgement regarding sequence length and time for each of the small steps, depending on their class's needs, 'lingering longer' when required.

Lessons are carefully crafted and set out in detail well-tested methods to teach a given mathematical topic. Maths lessons begin with revisiting of prior learning through the use of Flashback 4 – this material offers 4 questions asking children to recall knowledge from their current unit of learning, their previous unit of learning and learning from prior year groups. A starter activity will then activate children's prior knowledge relevant to that lesson's content before teachers move on to their instruction for that lesson's content. Teacher input will include a variety of representations needed to introduce and explore a concept effectively and also give related explanations and questions to children. Children will then complete guided activities to practise this concept before moving on to independent tasks in their maths books to consolidate their learning

It is important to assess what children do, and do not, know in order to extend learning for all children. A variety of methods are used to assess children's mathematical understanding, and teaching staff check what children know in a variety of contexts. Information collected is used to inform next steps for teaching. Formative Assessment (AfL) - (monitoring children's learning) Assessment is an integral and continuous part of the teaching and learning process at Malvern Parish and much of it is done informally as part of each teacher's day to day work. Teachers use formative assessment strategies such as effective questioning, observation, informal testing, feedback and responses to their input and marking and observing children participating in activities. Findings from these types of assessment are used to inform future planning.

Children's progress and attainment in fundamentals such as number bonds is monitored through weekly, low stakes testing in KS1.

5. Use high quality targeted support to help all children learn mathematics

Children who are identified as not keeping up with the curriculum in Y1 and 2 may be assessed using the Numberstacks intervention program or may receive additional small group Fluency Bee input. High quality targeted support provides effective extra support for children. Small-group support is effective because children with the greatest needs are supported by the most experienced staff. Staff have been provided with training, support and resources to complete targeted activities using Fluency Bee or Number Stacks materials outside of the maths lesson. Sessions are brief and regular and explicit connections are made between targeted support and everyday activities or teaching.

Early Mathematicians beyond EYFS and KS1

1. Adaptive teaching

As in KS1, the large majority of children progress through the curriculum content at the same pace. For those who need it, differentiation is achieved through individual support and adaptive teaching for all. The questioning and scaffolding individual children receive in class as they work through problems will differ and children who take longer to grasp concepts or need additional support to do so will benefit from the use of scaffolds such as concrete apparatus and further adult support. Please see 'Strategies to remove potential barriers in Maths' for more information on how we support our

learners. A small minority of children will benefit from a more personalised curriculum, following curriculum statements from outside their year group, to help close the gaps.

2. Reinforcing number fluency

In Key Stage 2, teachers use discrete arithmetic sessions to revisit and secure knowledge from their prior year groups. At least three times a week, all pupils have the opportunity to revisit the fundamentals of number bonds or times tables, practise or consolidate mental and written methods for calculation and revisit any gaps from their current learning. In Years 3 and 4, content is provided by the Fluency Bee scheme from White Rose Maths. In Year 5 and 6, staff draw on resources from Maths Shed, White Rose Education and Classroom Secrets as well as other resources to support these sessions.

3. Additional interventions

A small proportion of children will need additional support outside of the maths lesson to support their acquisition of mathematical concepts. Additional 1:1 or small group support may be provided by adult using NumberStacks or Fluency Bee activities appropriate to the gaps in their knowledge and master the foundations of the number system.