Our Approach to Teaching Mathematics

Our Curriculum Intent: *To create a flexible, responsive curriculum which can be adapted to reflect children's interests and teachers' passions whilst ensuring rigorous progression and coverage of key skills and knowledge*

Mathematics is a creative and highly interconnected discipline that has been developed over centuries, providing the solution to some of history's most intriguing problems. It is essential to everyday life, critical to science, technology and engineering, and necessary for financial literacy and most forms of employment. A high-quality mathematics education therefore provides a foundation for understanding the world, the ability to reason mathematically, an appreciation of the beauty and power of mathematics, and a sense of enjoyment and curiosity about the subject. National Curriculum, 2013

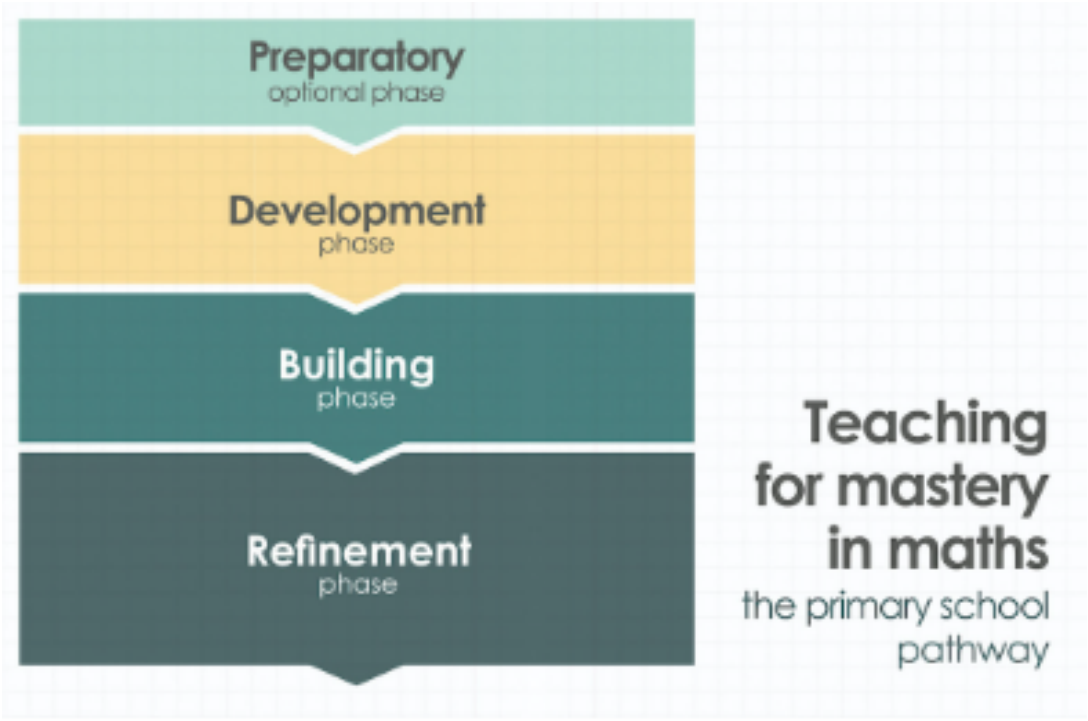
At Hollybush our aim is for all children to develop a confidence and love for maths. We want children to see the connections within maths and how it can be used both in other subjects and the real world. We believe that

everybody has the potential of becoming a successful mathematician. We recognise that maths plays an important role in everyday life and provides a foundation for understanding the world. Through our mastery approach we will provide our children with rich opportunities to work both with others and independently in order that they:

- Develop a deep understanding of number;
- Become mathematically observant;
- Learn efficient ways of tackling calculations and problems within a range of contexts;
- Become fluent in the fundamentals of maths - times tables, number bonds, and place value and
- Can use maths with confidence in other subjects such as science, computing and design and technology.

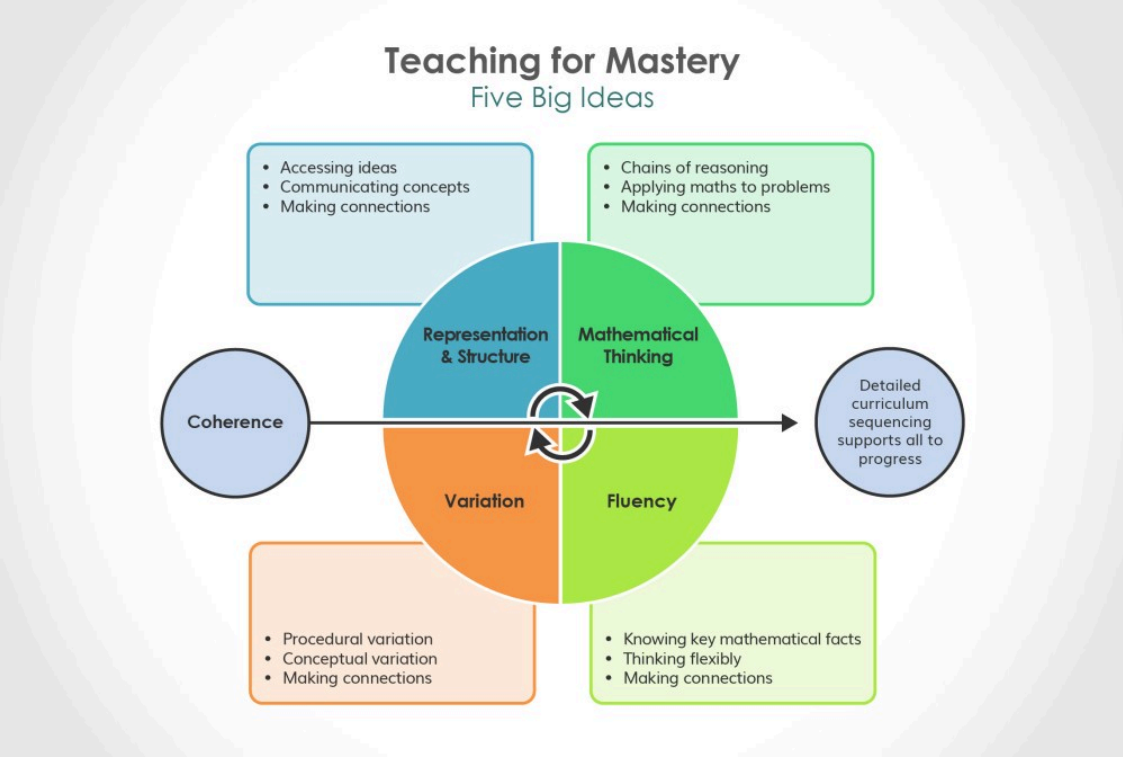
Hollybush is at an exciting time in the development of maths across the school. Since September 2024 we have partnered with our local maths hub - Matrix Maths Hub to develop our mastery approach to the teaching and learning of maths.

Teachers in Reception, Year 1 and Year 2 have started NCETM's (National Centre for Excellent in the Teaching of Mathematics) Mastering Number at Reception and KS1 programme. This programme aims to secure firm foundations in the development of good number sense for all children from Reception through to Year 1 and Year 2. The aim over time is that children will leave KS1 with fluency in calculation and a confidence and flexibility with number. Attention will be given to key knowledge and understanding needed in Reception classes, and progression through KS1 to support success in the future.



At the same time (September 2024), the Year 3 and Year 4 teachers have started the programme, '[Primary Teaching for Mastery – Development]'. The teachers have joined a Work Group, consisting of other local primary schools. Each Work Group is led by a trained Primary Mastery Specialist. Work Groups meet regularly to plan, observe and discuss teaching for mastery. In between meetings, teachers explore mastery approaches in their own classrooms and across their school. Support is provided from a local classroom-based Mastery Specialist who leads the group. This model of professional development involves hands-on learning and peer-to-peer support. It is evidence-based and designed to support substantial long-term change. To date (27/11/2024) an initial visit (14/11/2024) to the Primary Mastery Specialist's school has taken place. As a result of this visit small changes are already taking place across the school. Staff have been encouraged to use three key questions in each maths lesson: 'What do you notice? What is the same? What is different'. This is to encourage all children to become more maths observant. Our Primary Mastery Specialist has visited Hollybush (21/11/2024) and a Maths Hub: Audit Tool completed - this will feed into the school's maths action plan.

We have adopted the principles of mastery maths which is based on the 5 big ideas of: coherence; representation and structure; mathematical thinking; fluency and variation.



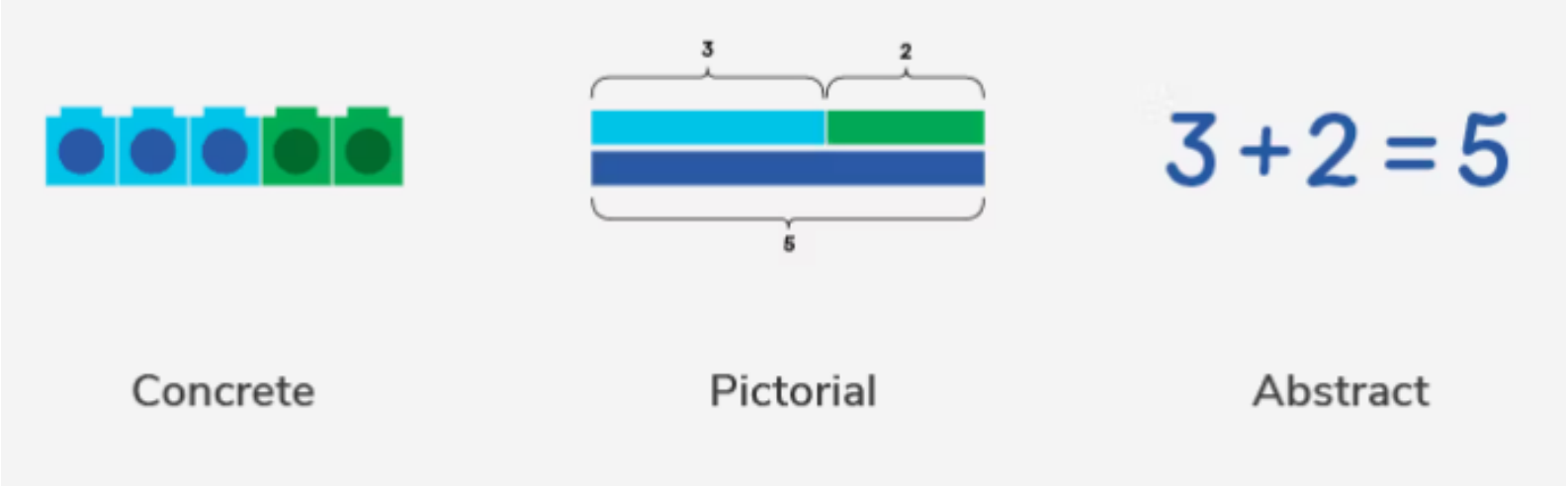
Hollybush uses the White Rose Maths Curriculum alongside other materials including Herts Essential Maths to support the teaching of maths. Both schemes meet the requirements of National Curriculum 2014. Whilst we recognise the benefit of well thought out and resourced schemes, we do not want teachers to become over reliant on these schemes. As professionals it is important that they develop a secure understanding of maths subject knowledge and its pedagogy; one of the key reasons for embarking on the two maths mastery programmes; to ensure all our teaching staff are not just confident primary mathematicians but experts in mastery.

The White Rose Maths Curriculum is a mastery-based scheme and:

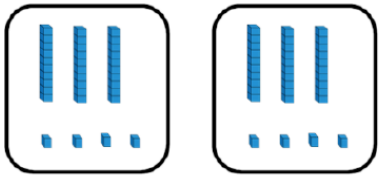
- **Puts numbers first:** number is at its heart; confidence with numbers is the first step to competency in the curriculum as a whole.
- **Puts depth before breadth:** the scheme reinforces knowledge again and again.

- **Encourages collaboration:** children can progress through the scheme as a group, supporting each other as they learn.
- **Focuses on fluency, reasoning and problem solving:** the scheme gives children the skills they need to become competent mathematicians.

At the heart of this mastery is the **Concrete Pictorial Abstract** (CPA) approach. Research shows that when children are introduced to a new concept, working with concrete physical resources and pictorial representations leads to a better understanding of abstract concepts.



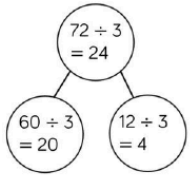
Base 10/Dienes (division)



$68 \div 2 = 34$

Tens	Ones

$72 \div 3 = 24$



Benefits

Using Base 10 or Dienes is an effective way to support children's understanding of division.

When numbers become larger, it can be an effective way to move children from representing numbers as ones towards representing them as tens and ones in order to divide. Children can then share the Base 10/ Dienes between different groups e.g. by drawing circles or by rows on a place value grid.

When they are sharing, children start with the larger place value and work from left to right. If there are any left in a column, they exchange e.g. one ten for ten ones. When recording, encourage children to use the part-whole model so they can consider how the number has been partitioned in order to divide. This will support them with mental methods.

We follow the White Rose Calculation Policy for Years 1-6. The policy focuses on the four main operations: addition, subtraction, multiplication and division. At the start of each policy - Addition and Subtraction / Multiplication and Division - there is an overview of the different models and images that can support the teaching of different concepts. Many of these models and images will be used by the teachers in the day to day teaching of these number operations. These models and images support the concrete pictorial abstract (CPA) approach and help children to understand abstract concepts. The policy provides explanations of the **benefits** of using the models and show the links between different operations (example taken from Calculation Policy - Multiplication and Division).

Each operation (addition, subtraction, multiplication and division) is then broken down into skills and each skill has a dedicated page showing the different models and images that could be used to effectively teach that concept.

Skill	Year	Representations and models	
Add two 1-digit numbers to 10	1	Part-whole model Bar model Number shapes	Ten frames (within 10) Bead strings (10) Number tracks
Add 1 and 2-digit numbers to 20	1	Part-whole model Bar model Number shapes Ten frames (within 20)	Bead strings (20) Number tracks Number lines (labelled) Straws
Add three 1-digit numbers	2	Part-whole model Bar model	Ten frames (within 20) Number shapes
Add 1 and 2-digit numbers to 100	2	Part-whole model Bar model Number lines (labelled)	Number lines (blank) Straws Hundred square

There is an **overview of skills** (example taken from Addition and Subtraction Policy) linked to year groups to support consistency through out school. This is really helpful for parents if they want to support the teaching of the different operations at home.

Further information about **Progress Mapping** and **Timetables** for Years 1-6 can be found in the Maths section of the Curriculum page on the school's website.

We encourage a breadth and depth of understanding in each maths lesson by building conceptual understanding, addressing misconceptions and providing regular opportunities for all children to work through reasoning and solving problems. Fluency is highly valued and practised daily during early morning work and at the start of maths lessons. Children are encouraged to not just do maths but to see maths. Lessons consist of teacher input with as much whole class participation as possible. This includes: thinking aloud, responding to questions, whiteboard work and sharing ideas with a partner. Next comes the opportunity to put into practice what has been taught. Children will be given the choice (sometimes under teacher direction) to choose either ARE (age-related expected) work or (greater-depth) work. Depending on the teacher's formative assessment during the first part of the lesson will depend on whether they support a guided group working on the ARE work. All the time the teacher will be encouraging children to have a go.

Mistakes are valued and shared in our maths classrooms as teaching points and whilst we want success we also recognise the need to bring in challenge at all levels of ability. To help develop deep understanding of maths and mathematical concepts teachers will promote the use of manipulatives including: base ten (dienes blocks), number lines, place value counters, tens frames, rekenreks. Children are also encouraged to make jottings to help their understanding and to explain the maths.

Online Maths

Years 1-6 have access to Times Table Rockstars (TTRS) and teachers are encouraged to plan in short TTRS sessions during the school week. Year 4 follow TTRS' Multiplication Tables Check schedule. In addition to this, children in Y2, 3, 4, 5 & 6 who struggle with maths (identified July 2024) are using the Mathletics/Mathseeds learning platform to build their confidence and plug gaps in their knowledge.

EYFS Statutory Educational Programme:

Developing a strong grounding in number is essential so that all children develop the necessary building blocks to excel mathematically. Children should be able to count confidently, develop a deep understanding of the numbers to 10, the relationships between them and the patterns within those numbers. (Development matters, 2023)

EYFS & The Nest

In Early Years, the focus is on developing children's deep understanding of numbers. Noticing, comparing and communicating is the foundation of all mathematical thinking. We allow children frequent and varied opportunities to develop their subitising skills (being able to visually see a number of objects instantly without needing to count them out one at a time) using 5 and 10 frames, a variety of loose parts such as pebbles and natural materials as well as signing number rhymes to develop children's ability to count for cardinality (the capacity to link numbers to collections, e.g., to know that "4" is the correct representation to denote a group of four objects.) and ordinality (the capacity to place numbers in sequence, for example, to know that 4 comes before 5 and after 3 in the sequence of natural numbers.)

Children will participate in short taught lessons and will be able to utilise learning through tasks in a dedicated maths area. Mathematically rich experiences support the daily objective throughout the continuous provision.

We aim to ensure that there are resources and opportunities for mathematical development across all areas of continuous provision; our pupils will have the opportunity to apply their mathematical knowledge to a range of subjects to maximise their enjoyment and curiosity about the subject. The adults model the use of these resources and appropriate mathematical language as they support the children in their play.

The staff use their knowledge and expertise to plan for a high quality learning environment which provides children with lots of opportunities to explore different aspects of number and numerical patterns as well as developing children's spatial reasoning skills.

Children will develop positive attitudes and interests in mathematics, look for patterns and relationships and spot connections. They will begin to develop a growth mindset and will have the confidence to 'have a go', talk to adults and peers about what they notice and not be afraid to make mistakes.

Knowledge Organisers

Knowledge organisers give further detail on each area of learning and can be found in the maths section of Curriculum on the school's website.

Adaptations for SEND children

We pride ourselves on providing learning opportunities that are accessible and ambitious for all learners, enabling all children to make progress and have a sense of achievement. We achieve this through sequential planning built on small steps, allowing skills to be scaffolded and extended as appropriate. We also create an ethos of not being afraid to make 'mistakes,' but instead, for children to be risk-takers, problem solvers and to develop resilience. Many of these principles and others are part of the mastery approach to maths and will

benefit all learners.

To support children with SEND to access the curriculum we will:

- Help all pupils achieve the best of their abilities, despite any special educational need or disability they may have.
- Ensure that staff are aware of and sensitive to the needs of individual pupils and that teaching is appropriate to meet those needs.
- Make suitable adaptations to the curriculum for children with SEND to fully develop their abilities, interests and aptitudes and gain maximum access to the curriculum.
- Encourage children to talk maths
- Allow children of mixed ability to work collaboratively
- Use stem sentences
- To encourage the use of manipulatives and representations to help secure abstract concepts
- To use online learning platforms such as TTRS or Mathletics that adapt to the needs of the pupils or can be tailored by the teacher to support the learning of children with SEND
- Tasks broken into chunks
- Larger/simpler resources eg. maps with picture keys
- Alternative resources eg. access to a you tube clip in place of a written hand out.
- Pre-teaching of key vocabulary
- Flexibility in group work eg. option to work alone if preferred
- Guided maths group - teacher led small group in a maths lesson
- The use of assessment for learning to ensure that children are developing their skills at their own level and

pace. We plan for
adaptations, such as, access to additional resources, additional time, adult support and small group pre-teaching or overlearning
1:1 interventions using Numicon

Assessment
Maths at Hollybush is assessed against key objectives from the National Curriculum and the Early Years Foundation Stage Profile.

Assessment takes two forms:

Formative assessment takes place on a day-to-day basis during teaching and learning, allowing teachers and pupils to assess attainment and progress more frequently. It begins with diagnostic assessment, indicating what is already known and what gaps may exist in skills or knowledge. If a teacher and pupil understand what has been achieved to date, it is easier to plan the next steps. As the learning continues, further formative assessments indicate whether teaching plans need to be amended to reinforce or extend learning.

Formative assessments may be questions, tasks, quizzes or more formal assessments. Often formative assessments may not be recorded at all, except perhaps in the lesson plans drawn up to address the next steps indicated.

Summative assessment sums up what a pupil has achieved at the end of a period of time, relative to the learning aims and the relevant national standards. The period of time may vary, depending on what the teacher wants to find out. There may be an assessment at the end of a topic/unit, at the end of a term or half-term, at the end of a year or, as in the case of the national curriculum tests, at the end of a key stage.

A summative assessment may be a written test, an observation, a conversation or a task. It may be recorded through writing, through photographs or other visual media, or through an audio recording. Whichever medium is

used, the assessment will show what has been achieved. It will summarise attainment at a particular point in time and may provide individual and cohort data that will be useful for tracking progress and for informing stakeholders (e.g. parents, governors, etc.).