Reviewed November 2019

Intent

'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 mathematical education therefore provides a foundation for understanding the world, the ability to reason mathematically ,an appreciation of the power and beauty of mathematics, and a sense of enjoyment and curiosity about the subject.' (DfE 2013)

Mathematics pervades all aspects of our lives and helps us to make sense of our world. With this in mind our intent is to teach our pupils the knowledge in all areas of maths that will support and promote understanding of mathematical skills and concepts in order to apply it to familiar and new situations. They will solve problems and we will instil an enjoyment in the subject by supporting pupils to engage with it and build upon their own learning progressively. Learning skills are an important aspect of mathematics and should be taught and learned in a context that provides purpose and meaning.

The National Curriculum provides a framework for mathematics in Key Stage 1. We have adopted a mastery curriculum; in line with this, the expectation is that the majority of pupils will move through the programmes of study at broadly the same pace. However, decisions about when to progress should be based on the security of the pupils' understanding.

In line with the aims of the National Curriculum for mathematics, we aim to ensure that our pupils gain:

- Deep and sustainable learning in mathematics which they are able to apply to a range of contexts
- An ability to build on previous knowledge
- Fluency, including the recall of number facts and patterns, to apply their knowledge rapidly and accurately
- An ability to reason about a concept and make connections
- Balanced procedural and conceptual understanding
- An ability to solve complex problems by breaking them down into smaller steps and showing resilience, through discussion about their thinking and understanding. This emphasis may result in less written work but facilitates a depth of understanding.
- Curiosity for learning which enables them to take calculated risks and learn from first-hand experience wherever necessary.

We aim to support pupils to make progress at their own pace, building on prior knowledge. Often misconceptions cause greater difficulties at a later stage of learning. We will promote smaller group learning opportunities whenever possible and encourage pupils to revisit their thinking to ensure

they feel secure in their understanding and able to move confidently on to next steps and challenges.

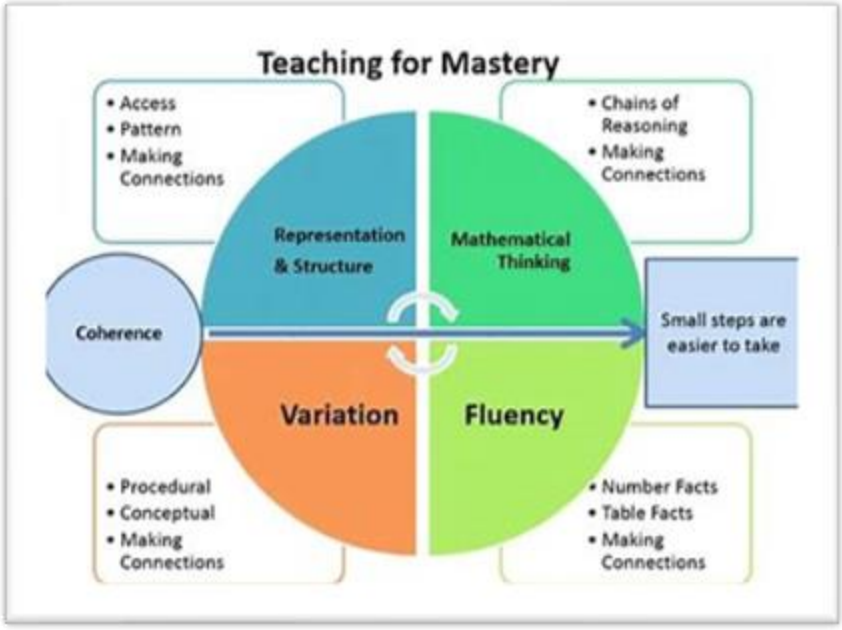
Implementation

At Pound Hill Infant Academy, you will typically see the following features to mathematics learning:

- The large majority of pupils progress through the curriculum content at the same pace. Differentiation is achieved by emphasising deep knowledge and through individual support and intervention. The questioning and scaffolding individual pupils receive in class as they work through problems will differ and pupils who grasp concepts rapidly are challenged through more demanding problems which deepen their knowledge further.

- Practise and consolidation play a central role to mathematics learning. Carefully designed variation within this builds fluency and understanding of underlying mathematical concepts in tandem.
- Teachers use precise questioning to test conceptual and procedural knowledge, and assess pupils regularly to identify those requiring intervention so that all pupils keep up.
- Teachers use the CPA approach (concrete, pictorial, abstract) approach to ensure that concepts are modelled to pupils using multiple representations. This ensures that procedural and conceptual understanding are developed simultaneously.
- Groupings are flexible, based on assessment for learning and pupils will work in different groups dependent on their need.

The Academy implements a mastery curriculum using the White Rose Maths Hub scheme of Mathematics teaching. This ensures small steps are taught in depth to develop a secure understanding through the following:



Fluency:

- Quick recall of facts and procedures
- The flexibility and fluidity to move between different contexts and representations of mathematics.
- The ability to recognise relationships and make connections in mathematics

Representation & structure

Mathematical structures are the key patterns and generalisations that underpin sets of numbers – they are the laws and relationships that we want pupils to spot. Using different representations can help pupils to 'see' these laws and relationships.

Variation

Procedural variation – This is a deliberate change in the type of examples used and questions set, to draw attention to certain features.

Conceptual variation – When a concept is presented in different ways, to show what a concept is, in all of its different forms.

Mathematical thinking:

- Looking for pattern and relationships
- Logical Reasoning
- Making Connections

EYFS

Mathematics within the EYFS is developed through purposeful, play based experiences and will be represented throughout the indoor and outdoor provision. The learning will be based on pupil's

interests and current themes and will focus on the expectations from Development Matters / Early Years Outcomes alongside the White Rose Schemes of Learning for EYFS. Mathematical understanding can be developed through stories, songs, games, imaginative play, child initiated learning and structured teaching. As pupils progress, they will be encouraged to record their mathematical thinking in a more formal way.

Key Stage 1 maths

Pupils spend far longer on key mathematical concepts in number. In Key Stage 1, we follow a structured curriculum map however, this is flexible to the needs of the pupils and therefore if most pupils have not grasped a concept thoroughly, there is flexibility to adapt the curriculum map and revisit concepts.

Those pupils who grasp concepts more rapidly are given opportunities to deepen their knowledge further and improve their reasoning skills, through rich problems, rather than accelerating on to new curriculum content.

Other subjects may have strong links to some maths topics allowing cross-curricular teaching. For example, shape through art or computing, measures through science or coordinates in geography. This is to ensure we continually maximise learning opportunities for all pupils across an entire curriculum.

Lesson Design

All pupils receive a daily maths lesson, although mathematical skills run through many other areas of the curriculum. This lesson is split in the middle by an assembly whereby the teacher assesses the pupils and regroups for same day intervention in order to support and extend those identified.

Each lesson focusses on one clear learning objective which all pupils are expected to master; extension activities enable those pupils who grasp the objective rapidly to extend their learning by exploring it at greater depth.

Teachers will briefly recap previous learning, before then building on this previous learning by introducing the next step to the pupils.

Teachers use manipulatives and visual representations at every opportunity to reinforce the concept and ensure deep and meaningful understanding. Pupils have the opportunity to practise the new skills using carefully crafted and varied questioning and talk will be used regularly to allow the pupils the opportunity to feedback as to how they solved problems.

During the teacher input, any additional staff should be assessing and identifying those pupils who do not grasp the concept as quickly or fully as others. This information will then be passed back to the teacher so that the teacher can work directly with these pupils during independent work (before assembly). During independent learning the pupils should, as far as possible, practise the skills that they have acquired independently to avoid an over-reliance on adults, however

throughout this time, any additional staff should work with different pupils to support and assess learning.

Teachers will teach the input and the pupils will have had an opportunity for independent application of the concept. Teachers will then assess which pupils are not secure with the concept and provide a rapid intervention, or guided group work, where required, to address any misconceptions.

Interventions

Teachers will use formative assessment to identify pupils who have not grasped the concept, or who are working significantly behind their peers. Teachers will aim to intervene rapidly where pupils have not grasped the concept and provide a same-day intervention to address this.

Using assessment for learning, they will make a decision as to whether an intervention needs to take place during the maths lesson (as pre-teaching to the concept that is being taught in the lesson) or at a different time, to enable the child to continue to access the appropriate curriculum for their year group.

Parental Involvement:

We actively promote parental engagement and believe that this supports our pupils' learning. Parents are encouraged to be involved by:

- Inviting them into the academy to discuss the progress of their child. (Please note due to COVID-19 this provision is currently suspended).
- Providing parents with a booklet with strategies to help their child at home and learning opportunities and a yearly report outlining their child's achievements and next steps.
- Holding workshops for parents or family days.

Inclusion and Differentiation

Teaching maths for mastery is different because it offers all pupils access to the full maths curriculum. Though the whole class goes through the same content at the same pace, there is still plenty of opportunity for differentiation. Taking a mastery approach, differentiation occurs in the support and intervention provided to different pupils, not in the topics taught, particularly at earlier stages. There is no differentiation in content taught, but the questioning and scaffolding individual pupils receive in class as they work through problems will differ, with higher attaining pupils, or those pupils who grasp concepts quickly, challenged through more demanding problems which deepen their knowledge of the same content. Those pupils who are not sufficiently fluent are provided additional support or intervention to consolidate their understanding before moving on. Pupils' difficulties and misconceptions are identified through immediate formative assessment and addressed with intervention – commonly through individual or small group support later the same day.

Resources

Within all lessons, teachers will utilise practical resources to ensure that concepts are represented to the pupils to gain depth of understanding.

It is acknowledged that a great deal of time is required for teachers to provide the visual reinforcement and varied practise activities to facilitate intelligent practice and support the learning. We have several resources that can support teachers with this planning – these can be found in a folder titled 'Teaching, Learning and Assessment' on the Teaching staff drive.

Monitoring and Review

The monitoring of maths teaching and pupil progress is the shared responsibility of teachers, subject leader and the senior leadership team. The work of the subject leader includes supporting colleagues in the teaching of maths, keeping up to date with current developments as well as providing a strategic lead and direction for the subject. The Academy's Local board and Trust receive regular updates to inform them of the vision for continually driving forward teaching for mastery.

Impact

As a result of teaching and learning in mathematics, our aim is that all pupils will be able to at least meet the key aims of the National Curriculum for maths and have developed skills that they are able to apply across the curriculum, preparing them for the next stages in their learning and with an enjoyment for maths.

Assessment

Teachers will use targeted questions and problems that require pupils to remember, understand, apply, analyse and evaluate their knowledge and skills. These assessments are used to inform the Target Tracker statements to assess the pupils on an ongoing basis and a judgement about whether a pupil is on track to achieve age-related expectations will be made at the end of the term by making a 'step' judgement. This information will all be recorded in Target Tracker and discussed at Pupil Progress Meetings.

Policy updated – September 2020

Due for review – July 2021