



Maths Policy

Intent

All children should feel confident and enthusiastic about their mathematics learning. They should be given the skills required to persevere with challenging problems, and they should feel empowered to discuss their learning confidently using the correct terminology.

New concepts are introduced using the 'Concrete, Pictorial and Abstract' approach to develop a strong conceptual understanding. Pupils are encouraged to explore new learning through varied and frequent practise. Children should be taught to confidently recall key mathematical facts and to calculate accurately and efficiently.

The development of mathematical reasoning is encouraged at every step of the learning process, with children regularly being prompted to discuss their understanding and make rich links between different areas of mathematics. Children are taught to approach problems with increasing levels of confidence, by drawing upon their solid mathematical understanding and working systematically and accurately. Concepts are revisited regularly throughout the school year, ensuring learning is consolidated.

Children should feel confident taking their learning beyond mathematics lessons, being able to apply their problem solving skills to other lessons, as well as in everyday life.

Implementation

A 'mastery' approach has been adapted and implemented at Pudsey Waterloo for the planning, delivery and engagement with mathematics. Review and feedback following the implementation of units as repeated blocks over the academic year, with little to no interlinking and relating of skills and knowledge, was highlighted as one of the main reasons for clear gaps in knowledge and one of the possible causes for slower progression.

We have therefore used the White Rose Maths Scheme of Work to timetable mathematical units that are explored progressively, drawing on resources, data and suggestions from reliable sources such as NCETM and nrich.co.uk to link mathematical talk and knowledge across the various units (e.g. multiplication and area).

When planning for objective coverage, teachers are expected to take the following mastery strategies into account:

- **Small steps**
- **Ping pong style of delivery**
- **Implementing the Concrete, Pictorial and Abstract (CPA) approach to introducing, exploring and applying mathematical concepts**
- **Applying/using the Bar Model approach as a strategy to approach calculation/problems**
- **Considering key questions and mathematical vocabulary at the point of unit planning**
- **Multiple opportunities for verbal and written/drawn reasoning (explaining and using mathematical vocabulary to explain methods or reasoning) within unit exploration**
- **Inclusion of relevant problem-solving opportunities, where children are expected to draw on and apply multiple concepts to address or approach a challenge**
- **Modelling of all skills and approaches**
- **Modelling and sharing of efficient and accurate application of methods**
- **Opportunities to explore maths concepts/objectives at 'greater depth'**
- **Include all learners, providing relevant support for those with additional needs (educational, medical or otherwise)**

Units of work will be assessed upon the completion of each one, with teachers asked to use those published by WRM in the first instance, and to look to other sources (or create their own) if the pitch is too high/low. The end-of-year assessment will be completed in May (Years 2 and 6 SATs) or June (rest of the school) to provide a snapshot of individual annual progress

Teachers are expected to demonstrate a good subject knowledge of Maths beyond their own year group. They should be aware of the school calculation policy and how key concepts progress throughout school. Staff are provided with opportunities to access further training on key mastery strategies such as the Bar Model or applying the CPA approach for teaching concepts. In regular discussions with SLT or peers, areas of development are identified and teachers are proactive in developing their subject understanding.

Impact

All children should feel confident and enthusiastic about their mathematics learning. They should have opportunities to explore mathematical concepts on a declarative and procedural basis to ensure they develop fluency in new areas of learning. Once confident, children should transform this knowledge into strategies which enables them to reason and solve problems.

The exploration of mathematics should be interactive and engaging, with content made relevant to children's real-world experiences and contextualised to support consolidation and retention of knowledge and skill.

Approach and response to reasoning activities should improve term on term, with the expectation that by the end of the year, children are happy to accurately define and use mathematical vocabulary introduced by their teacher, as well as complete stem sentences to complete mathematical statements or reasoning.

Teaching and support staff should also see this period of implementation as an opportunity to highlight and further improve concepts that are received well and have clear impact on progress and learning, while also analysing and evaluating practice that needs to be addressed, reviewed or replaced.

Mathematics and the National Curriculum

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.

The national curriculum for mathematics aims to ensure that all pupils:

- become fluent in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately.
- reason mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language
- can solve problems by applying their mathematics to a variety of routine and nonroutine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.

Mathematics is an inter-connected subject in which pupils need to be able to move fluently between representations of mathematical ideas. The programmes of study are, by necessity, organised into apparently distinct domains, but pupils should make rich connections across mathematical ideas to develop fluency, mathematical reasoning and competence in solving increasingly sophisticated problems. They should also apply their mathematical knowledge to science and other subjects.

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 always be based on the security of pupils' understanding and their readiness to progress to the next stage. Pupils who grasp concepts rapidly should be challenged through being offered rich and sophisticated problems before any acceleration through new content. Those who are not sufficiently fluent with earlier material should consolidate their understanding, including through additional practice, before moving on.

Curriculum and school organisation

Planning

EYFS

Mathematical Development is planned and taught through whole class, daily maths lessons which follow mastery in maths theory and practice.

Adult led learning linked to NCETM progression documents, White Rose maths guidance and development matters criteria, all ensure suitable challenge through open ended, investigative learning and the teaching of concrete maths concepts. A dedicated maths area ensures children understand how resources can help them to learn and encourages children to develop their own interests linked to maths. Maths is also a core element of learning across provision, with opportunities inside and outdoors linked to mathematical concepts, problem solving, opportunities for reasoning and playing games.

KS1 and KS2

White Rose Maths Hub

Reception, KS1 and KS2 will follow the White Rose Maths Hub (WRMH) scheme of work for teaching mathematics. This document will inform lesson plans which will be written weekly. Objectives should be clear for individual sessions with teachers using their own judgement as to the length of time each individual small step from the WRMH scheme should take to deliver.

Session Structure

Individual lessons should be tailored to the needs of the learners and in consideration of the subject matter being learned. A variety of strategies should be used to deliver quality lessons for all pupils. A mixture of whole class input, group discussion, plenaries, independent and peer-supported work, as well as one-to-one feedback throughout the lesson should all be used with the express aim of moving learning forward and developing children's conceptual understanding of the subject matter. Independent tasks will be carefully planned. Children will access activities which lead them to make links between key concepts, and which support progression through a lesson's objective. Activities will be available for children who require extra practise with their procedural knowledge before developing their conditional knowledge in problem solving tasks.

Teachers should take every opportunity to assess children through questioning and use this formative assessment to again move learning forward and deeper. Although there is no defined structure to any one session, teachers should ensure that individual lessons give the children the chance to extend or deepen their knowledge of given concepts.

Resources

Children will have access to a wide range of mathematical resources. Children are given the chance to work with resources such as (but not exclusively) 10 frames, counters, bead strings, dice, white boards and Base 10 equipment to support their understanding of

increasingly challenging subject matter. Children should aim to develop their knowledge using these resources to create models and images to explore and explain their conceptual understanding in line with the schools Calculation Policy Maths. This firm basis in conceptual understanding will allow children to then feel secure when moving on to more formal methods of solving problems.

KIRFs

To support children in their declarative knowledge, teachers will revisit the Key Instant Recall Facts (KIRFs) aligned with their cohort regularly. Teachers will plan and deliver KIRF sessions at the start of their mathematics lesson. This will take the shape of a focussed starter that aims to promote the core recall facts needed to succeed within the mathematics curriculum. Each year group can refer to the Mental Calculation Progression document for details on what should be covered within specific cohorts.

Maths Revisit

To enable children to build on their procedural knowledge and to ensure taught skills are practised regularly, Maths Revisit sessions will take place in KS1 and KS2 classes. These sessions (approximately 4 per week) should be planned separately to the main maths teaching. These sessions will focus on the practise of calculation methods, as well as revision of previously taught topics. These sessions will be planned based on question level analysis of assessments at the end of specific blocks and terms. Maths Revisit provides a 'distance from learning' opportunity for children to further practise key areas of learning. The spaced retrieval of this learning supports children to remember more. They are also used as assessment tool by teachers to inform further teaching.

Use of Staff

Teaching and support staff should be used almost exclusively to improve learning outcomes for children during maths sessions. Support staff should be briefed prior to sessions and have a good knowledge of the vocabulary expectations for children as well as an overview of the key questions to enhance children's knowledge and understanding. Teachers and support staff should try to spread their time around the class so that all children receive an adequate amount of support and feedback on their learning throughout the lesson.

Learning Environment

The learning environment is one of the key tools that teachers should be using to enhance mathematics provision. Displays should reflect the current learning and be a useful tool for adults and children in the classroom. Displays should be used as Working Walls with models and images used to explain and detail key knowledge linked to the concepts being taught. As well as the current maths topic, the displays in the classrooms should reinforce the work done to improve children's understanding and knowledge of the KIRFs. Practical resources, as mentioned previously, should be readily available within the teaching environment for pupils to use.

Marking and Feedback

Children should receive timely feedback on the work they produce. This can take many forms but should always be centred on moving children's learning forward or giving them opportunities to deepen their knowledge and understanding of the given topic. This feedback should be completed regularly as Improvement Time (IT). IT tasks will take many forms and children should be given a range of tasks over time to ensure their knowledge and understanding is secure. Children will often be asked to revisit a question which they got incorrect, sometimes with a prompt helping them to correct their error. At times, IT tasks could involve next steps questions: What if we change ..? Does this still work if or the use ..? All feedback should be given in line with the schools marking and feedback policy.

Assessment

Formative

Teachers should use effective questioning as their first line of assessment and act on children's verbal and written responses immediately during lessons. After teaching, teachers should use the end of block assessments produced by the WRMH along with their termly assessments to assess gaps in children's knowledge. This information should then inform future planning with special reference to Maths Revisit Sessions.

Summative

Teachers will use NTS assessments during assigned assessment weeks. These tests should be analysed thoroughly by year group teams to develop an understanding of the topics and concepts children are failing to develop a sufficiently deep understanding of. This data should inform future planning at all levels. Staff will use OTrack to log and analyse data to identify groups and individuals in need of further support.

Children throughout EYFS are assessed against the Mathematical Development criteria identified in development matters. Judgements against the early learning goal and exceeding descriptors are made by the end of EYFS.