Mathematics at Wharton Primary
2023-2024

Intent, Implementation and Impact

Intent	Mathematics is important in everyday life and with this in mind, the purpose of mathematics at Wharton Primary School is to develop an ability to solve problems, to reason, to think logically and to work systematically. All children are challenged and encouraged to be the best they can be. New mathematical concepts are introduced using a concrete, pictorial and abstract approach; enabling all children to experience hands-on learning when discovering new mathematical topics, and allows them to have clear models and images to aid their understanding. We incorporate sustained levels of challenge through varied and high quality activities with a focus on fluency, reasoning and problem solving. Pupils are required to explore maths in depth, using mathematical vocabulary to reason and explain their workings. A wide range of mathematical resources are used and pupils are taught to show their workings in a concrete, pictorial and abstract form. We want all pupils at Wharton Primary School to experience the enjoyment of mathematics and develop a sense of curiosity about the subject with a clear understanding. At Wharton, we foster positive can do attitudes and we promote the fact that 'We can all do maths!' We believe all children can achieve in mathematics, and teach for secure and deep understanding of mathematical concepts through manageable steps. We use mistakes and misconceptions as an essential part of learning where children develop resilience and use mistakes as a learning tool. We aim for all pupils to: • Foster a positive attitude to mathematics where children develop the ability to think clearly and logically, with confidence, flexibility and independence of thought. • Understand the connectivity of patterns and relationships within mathematics. • Become fluent in the fundamentals of mathematics so that they develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately. • Be able to solve problems by applying their mathematics to a variety of problems with increasing sophistication, including in unfamiliar contexts and to model real-life scenarios.

	• Reason mathematically by following a line of enquiry to develop and present a justification, argument or proof using mathematical language. • Have an appreciation of number and number operations, which enables mental calculations and written procedures to be performed efficiently, fluently and accurately to be successful in mathematics. • Develop personal qualities such as perseverance, resilience, independent thinking, cooperation and self-confidence through a sense of achievement and success.
Implementation	Our whole curriculum is shaped by our school vision which aims to enable all children, regardless of background, ability or additional needs, to flourish and become the very best version of themselves they can possibly be. We teach the National Curriculum, supported by a clear skills and knowledge progression. This ensures that skills and knowledge are built on year by year and sequenced appropriately to maximise learning for all children. **White Rose & Deepening Understanding:** Every class from EYFS to Y6 follows the White Rose scheme of learning which is based on the National Curriculum. Lessons may be personalised to address the individual needs and requirements for a class but coverage is maintained. In order to further develop the children's fluency, reasoning and problem-solving, we use Deepening Understanding which correlates to the White Rose lessons and further develops children's understanding of a concept and the links between maths topics. We also use a range of planning resources including those provided by the NCETM and NRICH to enrich our children's maths diet. **NCETM Mastering Maths:** For the first time this academic year we are implementing this new programme across EYFS and KS1. All children in these year groups will be part of the intervention and staff will be accessing training in how to implement the programme. The programme will replace the number teaching from White Rose in the Reception classes and all other areas will be covered using White Rose. **Fluent in five & Consolidation/Pre-Teaching:** We have Start of Day Activities (fluent in five) in each class whereby children are set an addition, subtraction, multiplication and division task to ensure general maths knowledge and fluency are maintained and developed. While the class are solving the questions, the staff are able to support children with consolidation or pre-teaching ensuring they are confident with skills required for the upcoming session. **Online Maths Tools**: In order to advance individual children's maths skills in school and at home, we utilise Times Tables Rock Stars for multiplication practise, application and consolidation as well as Purple Mash. Children in KS1 also use Numbots.

	Cross Curricular: Maths is taught across the curriculum ensuring that skills taught in these lessons are applied in other subjects. **Concrete Pictorial Abstract (CPA)**: We implement our approach through high quality teaching delivering appropriately challenging work for all individuals. To support us, we have a range of mathematical resources in classrooms including Numicon, Base10 and counters (concrete equipment). When children have grasped a concept using concrete equipment, images and diagrams are used (pictorial) prior to moving to abstract questions. Abstract maths relies on the children understanding a concept thoroughly and being able to use their knowledge and understanding to answer and solve maths without equipment or images. We ensure that these processes are not rushed and the children are taught to use concrete resources independently when needed. **Assessment:** *Formative Assessment:* Assessment is an integral and continuous part of the teaching and learning process at Wharton and much of it is done informally as part of each teacher's day to day work. Teachers integrate the use of formative assessment strategies: effective questioning, clear learning objectives, the use of success criteria, effective feedback and response in their teaching and marking and observing children participating in activities. Findings from these types of assessment are used to inform future planning. *Summative Assessment:* More formal methods are used to determine the levels of achievement of children at specific times during the school year (November, March and June). We use NFER termly assessments as a way of recording children's progress in objectives covered across that specific term. (Y2 and Y6 also use past SAT papers). This information is them updated on class pupil progress grids, which determine progress for the whole, individuals and groups. These are discussed with SLT through termly Pupil Progress meetings. The results are used to monitor individual's progress year on year and to identify those children who have Special Educational Needs in mathematics. For those children that are identified by staff as higher attaining, they are catered for by additional challenge during maths sessions focussing on deepening their understanding. This is achieved through conceptual variation, problem solving, reasoning and application of known facts. These assessments will also inform teacher's planning for the next term and the teachers use these assessments for gap analysis where interventions are planned accordingly from this. **Continuing Professional Development (CPD)**: We continuously strive to better ourselves and frequently share ideas and things that have been particularly effective. We take part in training opportunities and regional networking events, such as the NCETM work groups. Our Maths leads are currently working with the Maths Hub and are in the second year of the Mastery programme.

Impact	By the time children leave Wharton, they will be fluent in the fundamentals of mathematics, including the varied and regular practice of increasingly complex problems over time. They will be able to reason mathematically by following a line of enquiry, understanding relationships and generalisations, and developing an argument, justification or proof using mathematical language. They can solve problems by applying their mathematics to a variety of problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions. **Pupil voice:** Through discussion and feedback, children talk enthusiastically about their maths lessons and speak about how they love learning about maths. They can articulate the context in which maths is being taught and relate this to real life purposes. Children show confidence and believe they can learn about a new maths area and apply the knowledge and skills they already have. Pictures of what the children think a mathematician is show that the children view themselves as competent mathematicians. One pupil showed that all children in our school are given the opportunity to become a mathematician regardless of race and gender. *See below for detailed outcomes of the most recent pupil voice.* **Evidence in knowledge**: Pupils know how and why maths is used in the outside world and in the workplace. They know about different ways that maths can be used to support their future potential. Mathematical concepts or skills are mastered when a child can show it in multiple ways, using the mathematical language to explain their ideas, and can independently apply the concept to new problems in unfamiliar situations. Children demonstrate a quick recall of facts and procedures. This includes the recall of the times table. **Evidence in skills**: Pupils use acquired vocabulary in maths lessons. They have the skills to use methods independently and show resilience when tackling problems. They have the flexibility and fluidity to move between different contexts and representations of maths. Children show a high level of pride in the presentation and understanding of their work. The children are provided with opportunities to develop the ability to recognise relationships and make connections in maths lessons. Teachers plan a range of opportunities to use maths inside and outside school. **Outcomes:** At the end of each year we expect the children to have achieved Age Related Expectations (ARE) for their year group. Some children will have progressed further and achieved greater depth (GD). Children who have gaps in their knowledge receive appropriate support and intervention.

Our Current Position

We have been working hard to develop consistency across all year groups and are currently part of the 'Mastery Readiness' programme as part of our local Maths Hub.

- We have rolled out the Whiterose maths planning across the school and seen the benefits that the small steps have had on the understanding and progress of the children.
- We have introduced a 'Fluent in five' daily task that is being used across the whole school which revisits addition, subtraction, multiplication and division as well as posing problem solving and exam style questions. This has had fantastic results, where used consistently over a term, enabling children to retain and master these key skills.
- We are in the fourth year (Sustaining) at the Maths Hub training programme.
- We have implemented the concrete, pictorial and abstract approach (CPA) across all key stages. We have invested in a wealth of tailored equipment to ensure consistency and progression of the use of resources across all year groups.
- We have updated the whole school calculation policy in line with the Whiterose and CPA approach. This is being implemented across school.
- The majority of year groups are now following the Mastery approach in Maths and are no longer streaming across their year group.
- EYFS and KS1 classes will be taking part in the NCETM Mastering Number programme this 2023-24 academic year. Teachers will be accessing training to assist with the implementation of the programme.

Principles of Teaching and Learning

As we continue our journey through mastery, our school uses a variety of teaching and learning styles in mathematics. 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. Through the use of NCETM STEM sentences, we encourage and develop children's mathematical talk and language. We value the importance of the correct use of mathematical vocabulary and children are continually encouraged to demonstrate their understanding both verbally and in written form. Teachers continually model the correct use of mathematical vocabulary to inspire the children and encourage them to use it independently.

We are continuing to develop conceptual variation within lessons as this builds fluency and understanding of underlying mathematical concepts in tandem. Teachers are developing their precise questioning in class to develop conceptual and procedural knowledge, and assess pupils regularly to identify those requiring intervention so that all children maximise their learning potential. Teachers ensure that concepts are modelled to children using our CPA approach. This ensures that procedural and conceptual understanding are developed simultaneously.

Early Years Foundation Stage

In our EYFS we value the importance of developing a firm understanding in number. This is to ensure that our children are able to build on these firm foundations as they move through our school. We provide a variety of fun and stimulating activities that give our children the opportunities to count confidently and develop a deep understanding of the number system within 10. Children also explore the relationships between numbers and the patterns within those numbers. Our whole school CPA approach begins in EYFS with a strong emphasis on providing our children with a wide range of learning opportunities to explore number practically. Learning opportunities may be through taught sessions with an adult or whilst in both indoor and outdoor continuous provision. In Nursery and Reception, the whole school WhiteRose Maths scheme is adopted and planning is taken from this document for areas other than number. We ensure that learning is planned for in small steps and that the children have rich learning opportunities to explore, consolidate and develop their learning independently within provision. The NCETM Mastering Maths programme will be used for the main teaching of number within the Reception classes.

Our EYFS Maths curriculum also provides a variety of purposeful opportunities for the children to develop their spatial reasoning skills across all areas of mathematics. These include shape, space and measures. Through our exciting and hands on Maths curriculum we foster positive attitudes towards mathematics. From as early as Nursey we encourage the children to learn from mistakes and know that it is OK not to be right every time. We use these mistakes to try again and to learn from.

Wharton's Maths Culture

Here at Wharton we have a 'Can do' approach towards maths and when we don't get something correct first time this is okay because we use this as an opportunity to learn, develop and deepen our knowledge. We aim to provide the children with an exciting and rich environment in which to flourish as mathematicians. Vocabulary linked to learning being taught is displayed and referenced to throughout lessons. Children are actively taught to utilise mathematical displays to assist them in their learning. Within each classroom is an area filled with appropriate maths resources that children are encouraged to access freely to aid independent working. Linked to our whole school house system themed maths weeks are woven into the curriculum, so that the whole school comes together to share the love of maths. This will be celebrated in assemblies and the school's media platform. To continue to promote maths through school, we have introduced a 'Maths Ambassador' award where a child from each class is selected weekly to wear the badge raising the profile of maths. Children are selected for a variety of reasons for this role and is not solely based on achievement.

Maths is a part of weekly homework and is used to consolidate learning from the week, this can be in the form of tasks set on Purple Mash (our online learning platform).

Maths Curriculum and Progression of Skills

Our Maths curriculum has been carefully designed following the progression map of skills from the National Curriculum and White Rose schemes of learning. This is being used for all planning and as a tool for assessment. It makes clear which skills need revisiting and should take priority. Here at Wharton we value the importance of understanding number and our children require extended teaching time in this area in particular. Therefore, we teach certain areas of maths using a cross-curricular approach and we feel that this embeds maths through all areas of the curriculum. Frequent staff meetings take place where the expectations are reviewed and evaluated, and where best practice is shared with all staff. Maths leads attend regular workshops with the Maths Hub to keep up to date with new initiatives and to continue our mastery journey.
As part of monitoring, the maths leads carry out frequent book looks, discussions with staff, meetings with SLT to analyse GAP analysis and gather assessment data in order to have an overview of maths across the school. Through this we are able to identify both the highest and lowest 20% to ensure that the correct provision is provided for these groups (interventions, challenge and curriculum design).

Currently, targeted interventions will take place, either 1:1 or within small groups, usually with adult support. The children who are expected to take part in these are determined through the assessments that can take place in daily sessions. These interventions include Numicon Intervention, IDL, focussed post and pre teaching linked to the 'Ready to Progress' criteria where appropriate.

In order to keep fluency in number a priority all children complete maths fluency activities daily incorporating questions from all four operations. This embeds and consolidates prior learning ensuring these skills are at the forefront of every day learning.

Developments to be considered

We are currently developing our mastery approach working alongside the Maths Hub to incorporate their 'Mastery Readiness' programme across the school. Therefore, we are continuing to review and implement strategies across school in order to evolve and improve. We are aware we are on a development pathway along our mastery journey. Linked to our whole school action plan we view maths as having an important role developing mathematical oracy and through the use of vocabulary walls and STEM sentences, we aim to improve and develop the use of children's mathematical vocabulary.

Resourcing

Last academic year, we introduced a more consistent approach to mathematical resources ensuring the children have familiarity and confidence to independently use them. Classes have recently set up maths resource areas where resources are always easily accessible for the children to independently select what they need in order to support their learning. As we follow a CPA approach the use of resources are integral in our maths teaching. Children only progress to the pictorial and abstract stage when they are ready. Additionally, from Y2-6 all children have access to a Timestable Rockstars account and children from Reception-Y2 have access to Numbots (two sessions per week)

Detailed Outcomes of Pupil Voice

- All children questioned enjoyed their maths lessons.
- Majority of children think they are good at addition, subtraction and times tables.
- Majority of children recognise there is a level of difficulty in their maths lessons but not too hard.
- The most common areas of difficulty were division and decimals.
- Majority of year groups use maths in other areas of the curriculum, predominantly in science.
- Majority of children have several strategies when they get stuck on a question.
- Use of resources during lessons were inconsistent across the school.
- Majority of children use or know they could use representations to help them solve a question.
- All children know and understand what they are learning.
- All children are frequently tasked with problem solving and reasoning questions.

- Range of suggestions to improve maths, with the focus on more active learning.
- Majority of children would like more maths opportunities in the timetable.
- Children know they are improving due to teacher verbal feedback and marking as well as their own confidence.
- All children receive in-lesson feedback and marking.
- Most children could discuss key vocabulary that had been explained by the teacher.