Mathematics Intent

Intent

In accordance with our school aims we intend to provide a variety of experiences which will encourage the children to reach their full mathematical potential by developing a positive and confident attitude towards mathematics. Through a mastery approach, at Kincraig we have a belief that all children can gain a deep, secure and conceptual understanding of maths through secure learning at each stage. Mathematics 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.

Our curriculum follows the White Rose Mastery approach. We intend to support the development of all children so that they; become highly numerate and fluent in number work, are confident in their ability to be successful in maths, have a self-concept of themselves as mathematicians and they appreciate that effort matters when used to practice intelligently. As they progress pupils become secure in their knowledge of the How, What and Why. The mapping of Mathematics across the school shows clear progression in line with age related expectations.

Teachers are trained to employ skilful questioning to gain depth in learning. They sequence knowledge in planning and teaching for learning progression, ensuring that pupils are challenged and experiences are broadened and enriched rather than superficially accelerated. Teachers encourage children to think mathematically and systematically to develop pupils' procedural and metacognitive knowledge. Their infectious enthusiasm and passion for maths is absorbed by our children.

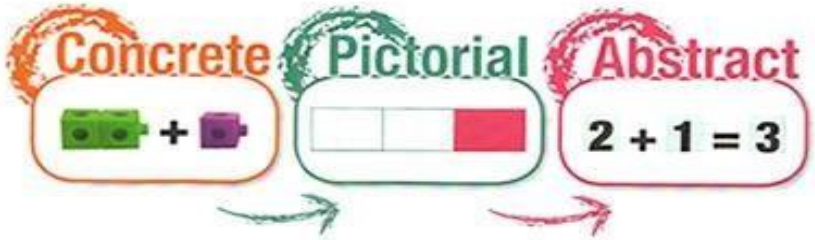
We recognise the importance of establishing a secure foundation in mental calculation and recall of number facts before standard written methods are introduced. We use accurate mathematical vocabulary in our teaching and children are expected to use it in their verbal and written explanations.

We endeavour at all times to set work that is challenging, motivating and encourages the pupils to think about how they learn and to talk about what they have been learning. Additional enrichment opportunities are provided for pupils to further develop mathematical thinking e.g. through cooking, music, and maths investigations and games.

Updated September 2021

Implementation

The teaching of mathematics at Kincraig Primary School adheres to the National Curriculum mathematics programmes of study 2014 and follows the 'White Rose' mastery scheme of work. The documents below outline what is taught in each year group by term.



We aim for each child to be confident in each yearly objective and develop their ability to use this knowledge to develop a greater depth understanding to solve varied fluency problems as well as problem solving and reasoning questions. Our children's conceptual understanding and fluency is strengthened by experiencing concrete, visual and abstract representations of a concept during a topic or lesson. Moving between the concrete and the abstract helps children to connect abstract symbols with familiar contexts, thus providing the opportunity to make sense of, and develop fluency in the use of, abstract symbols.

Discussion is essential to our learning and time is planned into lessons for this, task types are varied to suit different pupils and their learning preferences whilst reasoning in writing remains one of our key focuses. Investigative tasks are designed to allow pupils to follow lines of enquiry and develop their own ideas, justifying and proving their answers. Children work both collaboratively and independently solving problems, which require them to persevere and develop resilience.

Mathematical vocabulary is explicitly taught and discussed with children, who are encouraged to use it independently. Children are given opportunity to reason and solve problems regularly; learning is varied and allows for deep and secure understanding. Our ITrack data is reviewed termly and target children are selected for further support. Parents are informed of and encouraged to be involved in our school mathematics implementation through SeeSaw maths homework, TT Rockstars challenges, parent's evenings and yearly reports. Teachers are also all available for parents to speak to both before and after school.

Schools in England are required to administer an online multiplication tables check (MTC) to Year 4 pupils. The purpose of the MTC is to determine whether pupils can recall their times tables fluently, which is essential for future success in mathematics. It will help schools to identify pupils who have not yet mastered their times tables, so that additional support can be provided. To support the children with their multiplication practice we use 'Times Table Rockstars' as an online and fun learning platform which also offer resources to be used in the classroom.

CPD is important in maths. All staff are encouraged to raise any issues they have within mathematics in order to ensure everyone is confident in what they teach. Staff meetings and twilight sessions are organised with a clear focus to address the needs of all staff and to develop the skills necessary to teach Mathematics effectively.

Implementation: Year Group Overview by Mathematical Operation

Early Years	Toddlers/Rising 3s	Pre-School	Reception
	Combine objects like stacking blocks and cups. Put objects inside others and take them out again Take part in finger rhymes with numbers. React to changes of amount in a group of up to three items. Compare amounts, saying 'lots', 'more' or 'same'. Develop counting-like behaviour, such as making sounds, pointing or saying some numbers in sequence. Count in everyday contexts, sometimes skipping numbers – '1-2-3-5'. Climb and squeeze themselves into different types of spaces. Build with a range of resources. Complete inset puzzles. Compare sizes, weights etc. using gesture and language - 'bigger/little/smaller', 'high/low', 'tall', 'heavy'.	Develop fast recognition of up to 3 objects, without having to count them individually ('subitising'). Recite numbers past 5. Say one number for each item in order: 1,2,3,4,5. Know that the last number reached when counting a small set of objects tells you how many there are in total ('cardinal principle'). Show 'finger numbers' up to 5. Link numerals and amounts: for example, showing the right number of objects to match the numeral, up to 5. Experiment with their own symbols and marks as well as numerals. Solve real world mathematical problems with numbers up to 5. Compare quantities using language: 'more than', 'fewer than.' Talk about and explore 2D and 3D shapes (for example, circles, rectangles, triangles and cuboids) using informal and	Count objects, actions and sounds. Subitise Link the number symbol (numeral) with its cardinal number value Count beyond ten Compare numbers Understand the 'one more than/one less than' relationship between consecutive numbers Explore the composition of numbers to 10 Automatically recall number bonds for numbers 0–5 and some to 10 Select, rotate and manipulate shapes to develop spatial reasoning skills Compose and decompose shapes so that children recognise a shape can have other

	Notice patterns and arrange things in patterns.	mathematical language: ‘sides’, ‘corners’; ‘straight’, ‘flat’, ‘round’. Understand position through words alone – for example, “The bag is under the table,” – with no pointing. Describe a familiar route. Discuss routes and locations, using words like ‘in front of’ and ‘behind’ Make comparisons between objects relating to size, length, weight and capacity. Select shapes appropriately: flat surfaces for building, a triangular prism for a roof, etc. Combine shapes to make new ones – an arch, a bigger triangle, etc. Talk about and identify the patterns around them. For example: stripes on clothes, designs on rugs and wallpaper. Use informal language like ‘pointy’, ‘spotty’, ‘blobs’, etc. Extend and create ABAB patterns – stick, leaf, stick, leaf. Notice and correct an error in a repeating pattern. Begin to describe a sequence of events, real or fictional, using words such as ‘first’, ‘then...’	shapes within it, just as numbers can Continue, copy and create repeating patterns Compare length, weight and capacity

National Curriculum

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Addition	Combining two parts to make a whole: part whole model. Starting at the bigger number and counting on- using cubes. Regrouping to make 10 using ten frame.	Adding three single digits. Use of base 10 to combine two numbers.	Column method- regrouping. Using place value counters (up to 3 digits).	Column method- regrouping. (up to 4digits)	Column method- regrouping. Use of place value counters for adding decimals.	Column method- regrouping. Abstract methods. Place value counters to be used for adding decimal numbers.
Subtraction	Taking away ones Counting back Find the difference Part whole model Make 10 using the ten frame	Counting back Findthedifference Part whole model Make 10 Use of base 10	Column method with regrouping. (up to 3 digits using place value counters)	Column method with regrouping. (up to 4digits)	Column method with regrouping. Abstractforwhole numbers. Start with place value counters for decimals- with the same amount of decimal places.	Column method with regrouping. Abstract methods. Place value counters for decimals- with different amounts of decimal places.

Multiplication	Recognising and making equal groups. Doubling Counting in multiples Use cubes, Numicon and other objects in the classroom	Arrays- showing commutative multiplication	Arrays 2d×1d using base 10	Column multiplication- introduced with place value counters. (2 and 3 digit multiplied by 1 digit)	Column multiplication Abstract only but might need a repeat of year 4 first(up to 4 digit numbers multiplied by 1 or 2 digits)	Column multiplication Abstract methods (multi-digit up to 4 digits by a 2 digit number)
Division	Sharing objects into groups Division as grouping e.g. I have 12 sweets and put them in groups of 3, how many groups? Use cubes and draw round 3 cubes at a time.	Division as grouping Division within arrays- linking to multiplication Repeated subtraction	Division with a remainder-using lollipop sticks, times tables facts and repeated subtraction. 2d divided by 1d using base 10 or place value counters	Division with a remainder Short division (up to 3 digits by 1 digit- concrete and pictorial)	Short division (up to 4 digits by a 1 digit number including remainders)	Short division Long division with place value counters (up to 4 digits by a 2 digit number) Children should exchange into the tenths and hundredths column too

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Multiplication/ Division	. .Counting, unitising and coins	Structure: multiplication representing equal groups Times tables – groups of 2,5,10 and factors of 0 or 1 Commutativity, doubling and halving Partitive and quotitive division	Times tables – 2,3,4,6,7 and the patterns across the tables	Connecting multiplication and division and the distributive law Connecting multiplication and division, and the distributive law Times table:11 and 12 Division with remainders Calculation: multiplying and dividing by 10 and 100 Multiplication/Division: partitioning leading to short multiplication Multiplicative contexts: area and perimeter	Using equivalent to calculate Calculation: multiplication and division by whole numbers Factors, multiples, prime numbers and composite numbers	Multiplication strategies for larger numbers and long Multiplication Division: dividing by two digit divisors Mean, Average and equal shares Scale factors, ratio and proportional reasoning Combining division with addition and subtraction Decimal place value knowledge multiplication and division Multiplicative contexts: area and perimeter

Fractions			Preparing the fractions: whole part whole Unit/non-unit fractions: identifying, representing and comparing Adding and subtracting within one whole	Working across one whole: improper fractions and mixed numbers Multiplying whole numbers and fractions	Finding equivalent fractions and simplifying fractions	Multiplying fractions and dividing fractions by a whole number Linking fractions, decimals and percentages

Impact

The impact of our mathematics curriculum is that children understand the relevance of what they are learning in relation to real world concepts. We have fostered an environment where Maths is fun and it is OK to be 'wrong' because the journey to finding an answer is most important. It is the expectation 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.

A mathematical concept or skill has been *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 will have quick recall of facts and procedures. They will have the flexibility and fluidity to move between different contexts and representations of mathematics. They will be able to recognise relationships and make connections in mathematics.