Clifton Primary Maths Curriculum

Intent:

At Clifton, we aim to promote curiosity, perseverance and a real thirst for learning, building a culture of deep understanding, confidence and competence in maths – a culture that produces strong, secure learning and real progress. No matter what their starting points, we help pupils across the whole school to achieve their full potential. We aim to build assured, happy and resilient mathematicians who relish the challenge of maths. Our intent is for them to become independent, reflective thinkers, whose skills not only allow them to achieve in maths but also provide meaningful contexts in order to support them across the curriculum.

In Key Stages One and Two, teachers cover objectives set out in the Programmes of Study from the National Curriculum and follow the 'White Rose Maths' schemes of work to reduce teacher workload and support subject knowledge. We aim to provide all pupils with full access to the curriculum, enabling them to achieve confidence and competence – 'mastery' – in mathematics. We have high expectations for every pupil. We plan for our pupils to achieve greater depth by keeping problem solving at the centre. Place value and number is at the heart of each topic; therefore, it is taught at the start of each year and is built upon as the year progresses.

We aim to develop children's enjoyment of maths and provide opportunities for children to build a conceptual understanding of maths before applying their knowledge to everyday problems and challenges. Lessons include times table practice, reviews of previously taught skills, knowledge and vocabulary and opportunities to reason and problem solve.

By the end of Nursery:	Pupils will show curiosity about numbers by offering comments or asking questions. They will begin to show an interest in numerals in the environment and representing numbers. Pupils will begin to realise not only objects, but anything can be counted, including steps, claps or jumps. They will show interest in shape by taking part in sustained construction activities or by talking about shapes or arrangements and will show interest in shapes in the environment.
By the end of Reception:	Pupils will begin to use everyday language related to money. They will order and sequence familiar events as well as record, using marks that they can interpret and explain.
By the end of Year 1:	The confidence of the pupils will be developing as well as mental fluency with whole numbers, counting and place value. This should involve working with numerals, words and the four operations, including with practical resources. At this stage, pupils will be developing their ability to recognise, describe, draw, compare and sort different shapes and use the related vocabulary. Pupils will also be exposed to using a range of measures to describe and compare different quantities such as length, mass, capacity/volume, time and money.
By the end of Year 2:	By the end of year 2, pupils will know number bonds to 20 and be precise in using and understanding place value. Pupils should read and spell mathematical vocabulary, at a level consistent with their increasing word reading and spelling knowledge at key stage 1. Their confidence will be improving and they will be using quick recall of number facts to apply to word problems.
By the end of Year 3:	Pupils will become increasingly fluent with whole numbers and the four operations, including number facts and the concept of place value. Pupils will develop efficient written and mental methods and perform calculations accurately with increasingly large whole numbers. By the end of year 3, pupils will be developing their ability to solve a range of problems, including with simple fractions. Teaching should also ensure that pupils draw with increasing accuracy and develop mathematical reasoning so they can analyse shapes and their properties, and confidently describe the relationships between them. It should ensure that they can use measuring instruments with accuracy and make connections between measure and number.
By the end of Year 4:	By the end of year 4, pupils should have memorised their multiplication tables up to and including the 12-multiplication table and show precision and fluency in their work. Pupils should be able to read and spell mathematical vocabulary correctly and confidently, using their growing word reading knowledge and their knowledge of spelling.

By the end of Year 5:	Pupils should be able to demonstrate increasing sophistication in solving problems. They should be developing the connections between multiplication and division with fractions, decimals, percentages and ratio. Pupils should be able to demonstrate quick and accurate recall of core facts. By the end of year 5, pupils should develop their ability to solve a wider range of problems, including increasingly complex properties of numbers and arithmetic, and problems demanding efficient written and mental methods of calculation. Pupils will be beginning to describe, explain, convince, justify and improve their work and show high levels of reasoning.
By the end of Year 6:	By the end of year 6, pupils should be fluent in written methods for all four operations, including long multiplication and division, and in working with fractions, decimals and percentages. Pupils should read, spell and pronounce mathematical vocabulary correctly. Pupils are able to apply their mathematics to solve problems confidently and with enjoyment, breaking them down into smaller steps and justifying their thinking using mathematical vocabulary. They persevere in seeking solutions and apply mathematical knowledge to science and other subjects. This is necessary in order for them to be able to recognise the importance of maths in the wider world as they become adults. They will be able to use their skills and knowledge confidently in their lives in a range of different contexts. Pupils are able to transfer skills and apply in different contexts.

IMPLEMENTATION:

At Clifton, we want our pupils to become fluent in the fundamentals of mathematics, to be able to reason and to solve problems. Our curriculum embraces these National Curriculum aims, and provides guidance to help pupils become:

Visualisers – we use the CPA approach to help pupils understand mathematics and to make connections between different representations.

Describers – we place great emphasis on mathematical language and questioning so pupils can discuss the mathematics they are doing, and so support them to take ideas further.

Experimenters – as well as being fluent mathematicians, we strive for pupils to love and learn more about mathematics.

Enrichment activities	<u>KES outreach programme</u> Clifton pupils from years 4 and 5 take part in this programme each year. The aim of the Outreach Programme is to engage with pupils under the age of 11 across the city and to raise their aspirations. Teachers and boys from King Edward's School are involved in the delivery of the Programme, which is constantly added to as new ideas for activities are put into practice. Over 190 teams compete each year in our two Maths Challenges for able mathematicians. These challenging and fun competitions are organised in a series of heats held throughout a term, and the winning team from each heat progresses to the grand finale of their competition. <u>Times Tables Rock Stars</u> Times Tables Rock Stars is a carefully sequenced programme of daily times tables practice. Each week concentrates on a different times table, with a recommended consolidation week for rehearsing the tables that have recently been practised every third week or so. Pupils are challenged with a range of times tables specific to their individual needs. A computer algorithm works out which times tables facts each pupil is consistently taking longer to answer and then it gradually starts to present these facts more frequently until pupils have mastered them. Children are able to compete against each other as well as against other users from across the world. This can take place in school and at home. Children also take part in class and year group battles where they compete against others within the school.

Learning Tools specific to Mathematics:	
White Rose Maths	All classes follow the White Rose scheme of work which is a transformational, whole-school primary maths programme. Questions are carefully crafted to develop children's fluency, reasoning, problem-solving skills and conceptual understanding for mastery. It focuses on core topics to build deep understanding. It promotes a flexible teaching culture which encourages teachers to be creative in their delivery and base this on the needs of their children with a core focus on multiple representations, mathematical talk and problem solving. The recovery curriculum from previous year groups has been built within the scheme ensuring children do not move on while there are gaps in previous learning. Lessons contain true/ false reasoning statements, a 'Flashback 4' (which embeds learning into the long-term memory by asking four questions from previous learning as well as key stage) and a clear emphasis on fluency, reasoning and problem solving in all lessons. Differentiation is demonstrated through depth of knowledge and variation of application allowing pupils to transfer their skills and apply them in a range of different contexts.
Basic skills sessions	Basic skills sessions, which run primarily in key stage 2, allow pupils to refine and master key strategies when solving arithmetic problems. Sessions are short and snappy, allowing pupils time to consolidate as well as build on previous learning.
Focus on speaking within lessons	At the heart of implementing the maths curriculum is a strong focus on mathematical talk. Subject-rich mathematical vocabulary is shared, revised and displayed in lessons and the understanding is assessed and reinforced through careful questioning. Pupils are encouraged to talk in all lessons in pairs and as a group, which encourages the pupils to learn together, from each other, appreciate each other's ideas and build on them together. In supporting one another through their learning, pupils build confidence in the ability to question and explain their learning and reason through their thought process and identify their own misconceptions.
Teaching methods	Through our chosen learning tool of White Rose, National Curriculum objectives for all year groups are broken down into small steps, allowing for more time to be spent on each objective and giving the pupils the best chance of achieving mastery through a deep and conceptual understanding. Teachers employ high quality modelling strategies, such as 'talk through your thought process' and explain your thinking, teacher's turn – pupil's turn and 'fade out' which is slowly giving children an increased responsibility of solving problems with increased independence. Key questioning is outlined within each lesson with an emphasis on pupils answering in full sentences to demonstrate their depth of understanding and to highlight any misconceptions. This gives the teacher the opportunity to provide immediate support within the lesson. Key learning is practised and pupils are given the chance to retrieve prior knowledge – this ensures that it becomes embedded into their long-term memory.