



Whiston Willis Primary Academy

Mathematics



Lead Responsibility	Kirsty Caldwell	Approved By Governors	
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MISSION STATEMENT

Our school is a safe, happy and inclusive place where everybody is valued, treated equally, respected and where difference is celebrated.

We believe that all members of our School community should reach their full potential academically, socially and emotionally.

We are committed to ensuring that every child is prepared for their future lives as responsible citizens with a strong moral purpose.

Learning is a lifelong journey and we strive for all children to enjoy learning; leading to independent, motivated 'Lifelong Learners' who are prepared to face the modern day wider world with enthusiasm.

Vision

At Whiston Willis Primary Academy, we want all children to know they are able to achieve well in Maths and to enjoy the problem solving aspect of our carefully sequenced curriculum. We know all children can access Maths and can develop a secure fluency of basic skills and so a focus will be given to this in order to approach more complex problems with greater confidence. We want our children to develop a love of Maths and be able to use the basic skills of Maths to succeed in an ever changing society. Our dream would be for our children to show such a love for maths that they go on to further study this at a higher level, or choose occupations that incorporate mathematical skills.

Rationale

To ensure our vision is met, we deliver our Mathematics teaching using a mastery approach. To teach for mastery means to incorporate the 5 main principles of mastery: representation and structure, fluency, variation, mathematical thinking and coherence. In line with this, our Early Years Foundation Stage follow a mastery approach to the teaching of mathematics, ensuring that all principles are included and do so in a way that can be built upon in Key Stage 1.

With this approach we believe we can help build children who believe they are good at maths and begin each lesson with an 'I can' attitude. Within our lessons, we build strong, resilient, hardworking problem solvers who show determination to complete any task given to them.

We ensure we provide children with a number of strategies that they can use to solve any problem they are faced with, allowing more children to progress in their learning at broadly the same pace. We believe all children, with the correct support, can access all areas of the Mathematics curriculum provided.

We are strong believers in ensuring children understand the concept of number and are not merely understanding rote counting. We develop a deeper, critical approach to learning new concepts and use the concrete, pictorial and abstract pedagogy to ensure all learners make progress suitable to their individual needs. Our mastery approach throughout school enables us to do this successfully.

Aims

The National Curriculum for Mathematics (2014) 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 non-routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.

The content and principles underpinning the mathematics curriculum reflect those found in high performing education systems internationally, particularly those of east and south-east Asian countries such as Singapore, Japan, South Korea and China. The principles and features that characterise this ‘mastery’ approach are:

- teachers reinforce an expectation that all pupils are capable of achieving high standards in mathematics.
- 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.
- teaching is underpinned by methodical curriculum design and supported by carefully crafted lessons and resources to foster deep conceptual and procedural knowledge.
- practice and consolidation play a central role. Carefully designed variation within this builds fluency and understanding of underlying mathematical concepts in tandem.
- teachers use precise questioning in class to test conceptual and procedural knowledge, and assess pupils regularly to identify those requiring intervention so that all pupils can progress at broadly the same pace.

Mathematics Curriculum

The Foundation Stage

In the Early Years Foundation Stage (EYFS), we relate the mathematical aspects of the children's work to the Development Matters statements and the Early Learning Goals (ELG), as set out in the EYFS profile document. Mathematics development involves providing children with opportunities to practise and improve their skills in counting numbers, calculating simple addition and subtraction problems, and to describe shapes, spaces, and measures. The profile for mathematics areas of learning are number (ELG 11) and shape, space and measures (ELG 12). We continually observe and assess children against these areas using their age-related objectives, and plan the next steps in their mathematical development through a number-based curriculum.

In the autumn term, children will be provided a ‘number per week’ mathematics curriculum. Each week, children will learn all about 1 number, up to 10. They will recognise how to make that number, how it applies to measure. In the spring term, children will be provided with the same system, focusing on numbers up to 20.

Years 1 to 6

Through Years 1 to 6 we use a coherent programme of high-quality materials and exercises, which are structured with great care to build deep conceptual knowledge alongside developing procedural fluency – this is done through the ‘Maths – No Problem!’ series.

The ‘Maths - No Problem!’ textbooks and workbooks are arranged in chapters and, over the course of the academic year, all units of the National Curriculum 2014 are covered.

The short term planning is done weekly, with teachers planning learning objectives, ‘Steps to Success’, identifying possible misconceptions, key vocabulary and ways to challenge pupils through higher order questioning and extensions.

If the needs of the children are best met following an alternative plan, which deviates from the National Curriculum 2014, then the class teacher and the SENCO/Phase/Subject Leader discuss this and decide on a way forward.

A Typical Lesson – Maths No Problem!

Lessons last approximately one hour and are taught daily in the morning. Each lesson consists of 5 parts; In Focus, Let’s Learn, Guided Practice, Worksheet and Extension.

In focus – This is a problem-solving activity, which prompts discussion and reasoning. All children work collaboratively to solve the problem using a method of their choice. In Key Stage One, these problems are almost always presented with objects (concrete manipulatives) for children to use. Sometimes, Key Stage 1 children may be prompted to represent their findings in a pictorial or abstract way within their journals. In Key Stage 2, children are asked to represent their findings in as many different methods as possible (concrete,

pictorial or abstract) – these will be noted in their Maths Journals when necessary and demonstrate their deeper understanding.

Let's Learn – During Let's Learn, the class teacher will lead pupils through strategies for solving the problem, including those already discussed. Teachers will model all methods to solving the problem and write these onto Working Walls which remains for the duration of the lesson and will be recapped in the following lesson. If children have used a method not planned by the teacher, this will be discussed, but methods taught through MNP will be modelled and encouraged in line with our calculation policy and to ensure consistency.

Guided Practice – After the teacher is confident they have addressed enough methods, the class will complete some questions in 'Guided Practice' in their Maths Journal. Carefully designed variation in these questions builds fluency and deep understanding. Children will teach each other using these calculation. All children are sat in mixed ability pairings, which provides opportunities for children to verbally explain processes before completing them in their journals. This provides opportunities for assessment from the teacher and the children to again, engage in conversation with peers, eradicating any misconceptions.

Workbook – Children will complete their workbook independently unless part of a guided group. Guided group children will be anybody who teachers have assessed as not being secure of the lesson objective, during Guided Practice. Within the guided group, children will highlight in pink the first question they have support with. Once the child has demonstrated an understanding, they continue the rest of the activity independently, highlighting green where they begin independently.

Extension – If children finish the workbook mostly correctly (see information regarding honesty sheets below), they will complete an extension activity – this is a reasoning or problem solving question centred on the learning objective. Finally, if they still have time available, children will complete a challenge activity that is centred on place value and calculation questions. These are all completed in their Maths Journal.

Honesty Sheets

It is proven, through research, that by children self-assessing, the progress they make is accelerated. Children are able to identify errors independently and retrace their steps when solving the calculation, thus finding at which stage they made an error. All children across Key Stage 2 have access to answer sheets, known as honesty sheets, for each worksheet they complete. If a child has made a mistake, they must note on their worksheet how they made the mistake – this is identified through children beginning the calculation again. Where there is no calculation e.g. place value questions, children will write where they have identified their own error.

Calculation policy

As a school we believe that all children, when introduced to a key new concept, should have the opportunity to build competency in this topic by using the CPA approach (Concrete, Pictorial, and Abstract). All information regarding this can be found in the Calculation Policy.

Resources

The use of mathematics resources is integral to the CPA approach and thus planned into our learning and teaching. Resources such as number lines, Cuisenaire Rods, multi-link cubes, dienes, hundred squares, shapes, etc. are located within a central storage for ease of access for all staff. Staff will prepare these resources prior to all lessons and encourage children to decide independently whether these resources will support them in achieving the lesson objective. Our ultimate aim is that all children will be confident and secure enough in the abstract representation that concrete manipulatives are no longer required.

Times Tables

To find more information regarding our approach to Times Tables, please refer to our Times Tables policy.

Early Bird Maths

Key Stage 1 and 2

Upon arrival to school each day at 8:40am, each class will have calculations, based on the government's 'Ready to Progress Criteria' advice, to complete. At 9am, staff will go through the answers for all children to be exposed regardless of time of arrival. This ensures that children are recapping and over learning fundamental mathematics skills daily, linking to our whole school approach to long term memory.

Classroom Display

EYFS

Classrooms in EYFS have displays and continuous provision areas rich in mathematical vocabulary and number recognition.

Key Stage 1

Teachers will model all strategies to children using flip chart paper. This will then be added to the Working Wall for children to be exposed to constantly. Staff will discuss vocabulary and display key words, to support with the reading within sessions, onto the Working Wall.

Key Stage 2

Maths Working Walls are displayed as whiteboards, with clear squares to demonstrate the similarities of children's journals. Staff will model all methods straight onto the Working Wall and this will remain throughout the lesson and the beginning of the subsequent lesson. Each wall will have sentence stem documents that will be provided to children at the beginning of each lesson to support oracy and written skills.

We recognise the importance of a stimulating learning environment. Each working wall has 'prior knowledge' and 'current learning' sections which include all objectives – this allows children to see the purpose of learning and how it fits into the bigger picture.

Pupil Support and Differentiation

Taking a mastery approach, differentiation occurs in the support and intervention provided to different pupils, not in the topics taught. We believe there should be no ceiling on children's learning and so provide the same level work to all children within a class, and vary support, questioning, resources and intervention time to allow all children to make progress.

There is little differentiation in the content taught but the questioning and scaffolding individual pupils receive in class as they work through problems will differ. Pupils' difficulties and misconceptions are identified through immediate formative assessment and addressed with rapid intervention – commonly through individual or small group support either within the lesson, or in the afternoon.

Intervention

At the end of each lesson, children will self-assess and place their books on a tracker; red, amber and green. Teachers will then assess workbooks and make a judgement on any child who has not shown a secure understanding of the objective. For these children, a same-day intervention will take place that afternoon. This will be delivered by either the class teacher or a member of support staff. If children still struggle to understand this objective, it will be addressed in the following lesson during In Focus – the teacher will deliver this before the child then works with peers to solve the In Focus task.

EQUALITY IMPACT STATEMENT:

Under the Equality Act 2010, we have a duty not to discriminate against any person based on 'protected characteristics'.

This policy has been equality impact assessed and we believe that it is in line with the Equality Act 2010 as it is fair, it does not prioritise or disadvantage any pupil and it helps to promote equality at Whiston Willis.

MONITORING:

The practical application of this policy will be reviewed by subject leaders in consultation with the curriculum lead within school regularly. The effectiveness of the policy is demonstrated through subject leadership reports to governors which include impact statements on outcomes for pupils and the quality of teaching and learning.

The policy document will be reviewed by the subject leader and curriculum leader annually or earlier if required.