

## William Austin Infant School

### Mathematics Policy

June 2024

#### Rationale

Mathematics is a highly interconnected discipline that enables children to make sense of the world around us through developing a child's ability to *calculate with fluency, reason and solve problems*. It enables children to understand and appreciate relationships, patterns and connections in both numbers and space in their everyday lives.

At William Austin Infant School, we provide a broad and balanced curriculum for all children. Our Maths planning, teaching and learning is based on the "Teaching for Mastery" ideas and principles. We encourage all of our children to reflect on their learning by talking about and discussing their learning linking to their own targets, lesson Learning Objectives and Success Criteria.

Teachers, children, parents and governors are all working together to raise standards for all our children.

#### Aims

At William Austin Infant School, our mission is to create a learning environment '**Where All Individuals Shine**'. All our aims reflect our school ethos and our approach to teaching and learning. They identify the aspects of our school community that we value highly and seek to promote to all of our children. We understand the importance of nurturing and developing all children into confident mathematicians who are not afraid to take risks and self-reflect on their learning.

The aims for teaching Mathematics in our school are to:

- Promote enjoyment, curiosity and enthusiasm for learning through practical activity, exploration and discussion. (CPA approach).
- Foster positive attitudes towards maths by developing pupils' confidence in using mathematical equipment and vocabulary.
- We strive to enable all of our pupils to explain their thinking and reasoning using the correct mathematical vocabulary.
- Developing a Growth Mindset learning community, where pupils are not afraid to take risks and thrive in challenging themselves and their learning further.
- To develop children's knowledge and understanding of Mathematical concepts. Enabling them to practice key skills and methods.
- Promote confidence and competence with numbers and the number system.  
We aim to support all of our pupils to develop a secure number knowledge by recalling key number facts with fluency, as well as spotting patterns and applying their learned knowledge accurately.
- Develop the ability to solve problems through decision-making and reasoning in a range of contexts. A particular focus on articulating their thinking and understanding which is taught, explored and developed through both verbal and recorded reasoning. There is a stronger emphasis on the verbal reasoning in order to encourage and secure use of mathematical vocabulary and language which is an overall aim for our school.
- Develop a practical understanding of the ways in which information is gathered and presented.
- Explore features of shape and space, and develop measuring skills in a range of contexts.
- Understand the importance of maths in everyday life.

## **Intended Outcomes**

Building on their prior knowledge and experience, pupils will develop an awareness of the underlying patterns in number and shape which are a foundation for calculating methods, measurement and shape work in the future. The development of mathematical language is of fundamental importance. Through our rich, broad and balanced Maths curriculum, children will develop a love of learning, enjoy mathematics and always strive to achieve their best. Our children at William Austin Infant School are resilient learners who recognise that learning is all about the journey to reaching an answer. Through our approach, children will achieve their own individual potential and be fully prepared for their next stage in learning.

In the Foundation stage children are taught:

- To develop *mathematical language*.
- Have a deep understanding of numbers to 10, including composition of these numbers and to be able to subitise.
- To compare, sort, match, order and count objects and to sequence everyday objects and events.
- To develop understanding of numbers as labels and for counting.
- To develop *automatic recall and retention of number facts*.
- To use *vocabulary* involved in adding and subtracting.
- To use *mathematical ideas and methods to solve practical problems*.

The main emphasis at Key Stage 1 is on:

- To develop *mathematical language* associated with number, shape and position.
- To develop and use number and mental calculation strategies.
- To increase children's *fluency* within number. Children will become familiar with the *fundamentals of mathematics*.
- To develop children's ability to *spot patterns and make connections*.
- Learning to count in preparation for work on place value and working with large numbers.
- Using the four operations of number in *relative contexts and problem solving*.
- To develop *problem solving and reasoning skills*.
- Recognise *patterns* and symmetry.
- Developing skills in measuring and estimating.

## **Teaching for Mastery- Maths Mastery**

In 2020-2021 William Austin Infant School joined a Maths Mastery Work Group with our Local Maths Hub (Enigma) to support us on our Mastery journey. By working closely with the National Centre of Excellence in the Teaching of Mathematics (NCETM) through joining this Hub, it has enabled us to keep up to date with the current research and best practice. It provides us with an opportunity to work closely with a Maths Mastery Specialist as well as a range of schools from across our local area.

The NCETM outline the "teaching for Mastery" approach through five big ideas. These can be seen below.

[https://www.ncetm.org.uk/media/42nndfqs/ncetm\\_five\\_big\\_ideas\\_updated\\_feb\\_2024.pdf](https://www.ncetm.org.uk/media/42nndfqs/ncetm_five_big_ideas_updated_feb_2024.pdf)



Implementing a Mastery approach in our Mathematics curriculum enables us to plan opportunities for children to:

- Plan a detailed curriculum, using small sequenced steps to support progress for all.
- Explain and justify mathematical reasoning.
- Develop core concepts and deepen their understanding.
- Deepen their thinking and reasoning skills by generalising and comparing.
- Ensuring the CPA approach is used.
- Encourage children to recognise and spot patterns to support them in solving an answer.
- To understand the learning journey to reach an answer.
- Communicate and present their findings effectively.

Explanations of the 'Five Big Ideas' below are taken from <https://www.ncetm.org.uk/teaching-for-mastery/mastery-explained/five-big-ideas-in-teaching-for-mastery/>

#### **Coherence**

Teaching is designed to enable a coherent learning progression through the curriculum, providing access for all pupils to develop a deep and connected understanding of mathematics that they can apply in a range of contexts.

#### **Representation and Structure**

Teachers carefully select representations of mathematics to expose mathematical structure. The intention is to support pupils in 'seeing' the mathematics, rather than using the representation as a tool to 'do' the mathematics. These representations become mental images that students can use to think about mathematics, supporting them to achieve a deep understanding of mathematical structures and connections.

### ***Mathematical Thinking***

Mathematical thinking is central to how pupils learn mathematics and includes looking for patterns and relationships, making connections, conjecturing, reasoning, and generalising. Pupils should actively engage in mathematical thinking in all lessons, communicating their ideas using precise mathematical language.

### ***Fluency***

Efficient, accurate recall of key number facts and procedures is essential for fluency, freeing pupils' minds to think deeply about concepts and problems, but fluency demands more than this. It requires pupils to have the flexibility to move between different contexts and representations of mathematics, to recognise relationships and make connections, and to choose appropriate methods and strategies to solve problems.

### ***Variation***

The purpose of variation is to draw closer attention to a key feature of a mathematical concept or structure through varying some elements while keeping others constant.

*Conceptual variation* involves varying how a concept is represented to draw attention to critical features. Often more than one representation is required to look at the concept from different perspectives and gain comprehensive knowledge.

*Procedural variation* considers how the student will 'proceed' through a learning sequence. Purposeful changes are made in order that pupils' attention is drawn to key features of the mathematics, scaffolding students' thinking to enable them to reason logically and make connections.

### **Role of the Subject Leader**

The mathematics subject leader is responsible for coordinating mathematics through the school. This includes to:

- Ensure teachers are familiar with the National Curriculum for Mathematics, advice and support them in its implementation throughout the school.
- Secure and sustain effective teaching of mathematics, evaluate the quality of teaching and standards of pupils' attainments and set targets for improvement.
- Provide support and guidance on the choice of appropriate teaching and learning methods to meet the needs of different pupils.
- Ensure that the headteacher, senior managers and governors are well informed about mathematics policies, plans and priorities, the success in meeting objectives and targets and professional development plans.
- Identify appropriate resources for the teaching and learning of mathematics and ensure that they are used efficiently, effectively and safely.
- Use data effectively to identify pupils who are underachieving in mathematics and, where necessary, create and implement effective plans of action to support those pupils.
- Attend CPD provided by LA mathematics consultants, keeping up to date with developments in mathematics and share information with staff by organising and leading the INSETs.
- Monitor planning, teaching, learning and standards through lesson observations and whole school work scrutiny and provide appropriate feedback and guidance.
- Ensure planning and implementation of schemes of learning and intervention programmes- White Rose Maths, NCETM Mastering Number Programme, NCETM Materials, and Ready to Progress Criteria.

## **Curriculum Planning**

In Reception year the planning follows the Early Learning Goals in the Early Years Foundation Stage curriculum (EYFS 2021).

### **Mathematics ELG: Number**

Children at the expected level of development will:

- Have a deep understanding of number to 10, including the composition of each number;
- Subitise (recognise quantities without counting) up to 5;
- Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 (including subtraction facts) and some number bonds to 10, including double facts.

### **ELG: Numerical Patterns**

Children at the expected level of development will:

- Verbally count beyond 20, recognising the pattern of the counting system;
- Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity;
- Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally.

Planning and teaching in KS1 follows the Statutory Guidance, National Curriculum in England: Mathematics Programmes of Study (September 2021).

The National Curriculum of Mathematics for Key Stage 1 is divided into the following areas:

### **Number**

- Number and place value
- Addition and subtraction
- Multiplication and division
- Fractions

### **Measurement/Geometry**

- Properties of shapes
- Position and direction

### **Statistics (only in Year 2)**

From September 2021, William Austin Infant School will use White Rose Maths programme to support the planning and teaching of mathematics. This will be further supported by the use of NCETM materials and the RTP documents released by the Department for Education.

The medium term plans provided from the White Rose Scheme have been matched to the National Curriculum objectives for each year group. This will highlight the areas of mathematics being taught and enable staff to ensure coverage of the whole curriculum is evident across the academic year. Medium term plans will be adapted to meet the needs of our pupils and ensure gaps in learning are addressed before moving on.

Through our short term planning, small steps in learning will be carefully thought of and planned for in order to ensure coherence and enable teachers to plan systematic sequenced lessons. This will support teachers in identifying the steps children need to secure in order to meet the learning outcomes and succeed. Opportunities for problem solving and reasoning will be built into every lesson and careful consideration to link these to real life contexts will be applied. Weekly plans for all lessons have clear learning objectives based on the teacher's detailed knowledge of the needs of the pupils. There are cross-curriculum links to mathematics wherever possible.

## Context of Teaching

The school uses a variety of teaching and learning styles in the lessons. Our principal aim is to develop children's knowledge, skills and understanding in mathematics. We do this through a daily maths lesson. During these lessons we encourage children to ask, as well as answer, mathematical questions. They have the opportunity to use a wide range of resources including a range of manipulatives to support their work.

Teachers and pupils use ICT in the lessons where it enhances the learning. We encourage the children to use and apply their learning in real life problems. In all the classes there are children of different mathematical abilities. We recognise this fact and provide suitable opportunities for all the children by matching the support given and resources used to ability of the pupil. We achieve this through a range of strategies. We ensure opportunities for pre-teaching and early intervention to ensure all pupils can succeed and teaching moves on at a pace for the whole class. There is a wide range of resources to support the teaching and learning of maths across the school.

There is a 'Calculation Policy' with recording methods for four operations in mathematics. This is to ensure consistency and progression throughout the school and reflect a whole school agreement in teaching mathematics. A copy of the policy is available on the school website to make the parents aware of the methods taught in school so they can support their children effectively.

## What you will expect to see in daily Maths lessons.

The design of our Maths lessons include:

- Flashback 4
- Review
- Main teaching and learning input
- Independent and group learning tasks
- Plenary activities.

- Clear Learning Objectives and Success Criteria.

- Carefully **sequenced lessons** that include **small steps** which are displayed on **learning journeys**. These are explained and shared with the children at the beginning of every lesson to highlight the **progression** in their learning and skills.

- **Mixed ability** seating with children '**Speaking to Succeed**' throughout the lesson.

- Development of children's use of **Mathematical Vocabulary and Language** through careful modelling, daily **Vocabulary Stars** and use of **STEM Sentences**. These encourage our children to respond in **full sentences**, by providing them with a clear **scaffold** and helps to reduce our children's cognitive overload. This supports our learners to **reason** and **explain** their understanding.

- Adults drawing children's attention to intended aspects of learning, including in relation to particular **mathematical structures**.

- Children **confidently explaining** their **reasoning**, **proving** their answers and **making connections** within their maths learning.

- Adults **scaffolding** learning, including through use of different **manipulatives**, to help children **secure and deepen** their understanding.

## **NCETM- Mastering Number Programme**

Recently, we have signed up to and joined the NCETM Maths Mastering Number programme for KS1. These sessions are in addition to our daily Maths lessons. The lead Teacher/s have termly sessions with the Hub to further support staff in delivery high-quality lessons and keep up to date with good practice and current research.

### **Principles underpinning Mastering Number at our school:**

- Developing fluency makes more children better able to access the maths learning in their main lessons.  
We do this by making connections between Mastering Number sessions and main lessons.
- Developing children's mindsets to look for mathematical relationships supports them with being able to make connections.  
We do this by drawing pupils' attention to the relationships between numbers, so that they can also connect them with prior learning where it has taken place.
- Building confidence enables more children to make progress.  
We do this by focussing on enabling all pupils to really understand small steps in learning.

### **Our Mastering Number sessions are organised with particular impacts in mind:**

- A daily input of 10-15 minutes in addition to and to complement daily maths lessons – minimum of two times a week – to children in Reception, Year 1 and Year 2.  
Moving forward to next academic year 2024/2025 this will be taught four times a week. This enables all children to focus on developing, securing and embedding their fluency of known number and related facts. It is in these sessions we focus on building all children's confidence in becoming mathematically observant, noticing relationships and patterns between numbers. Year 2 have more of an opportunity in these sessions to link the representation of numbers to the symbolic, progressing on from their learning in Year 1.
- Adults drawing children's attention to intended aspects of learning, including in relation to particular mathematical structures.  
This enables us to ensure children think deeply about the mathematics they are using.
- Adults scaffolding learning, including through use of different manipulatives, to help children secure understanding.  
This enables pupils to develop a more secure understanding of core mathematical structures. Seeing the same concept alongside different manipulatives and pictorial representations often leads to children making their own connections, thus deepening understanding.
- Conceptual variation – transferring understanding of the same mathematical concept through use of different contexts.  
When children transfer their learning through use of well thought out contexts that are varied, they become confident and make connections in learning.
- Linking the action and the thought – manipulatives secure understanding but are then visualised over time.  
When children have enough experience of using manipulatives and seeing pictorial representations, they then begin to visualise them.

## **Curriculum Links**

Mathematics links with many subjects across the primary curriculum and opportunities are taken to draw mathematical experience out of a wide range of activities. This will allow children to begin to use and apply mathematics in real contexts and is an integral part of the mathematics curriculum.

## **Inclusion**

In line with the school policy on Special Educational Needs, the Inclusion Manager, mathematics subject leader and the class teacher are involved in ensuring that pupils have work planned to meet their needs. Teaching assistants also provide additional support. Those pupils with significant needs in mathematics have specific mathematical targets on their Individual Education Plans (IEPs). IEPs are drawn up on a termly basis for each child in collaboration with the Inclusion Manager and the work is differentiated accordingly.

Teaching for Mastery is an inclusive approach and provides all learners with access to the full Maths curriculum. Where this whole class approach of moving together at a similar pace is adopted in all classrooms, there is still opportunities planned for and provided to support all learners. Differentiation in a mastery approach is through the use of support given to pupils as well as use of manipulatives and resources. The use of questioning and scaffolding is one way in which learners can be supported through their work. For example a lower attaining child may initially have more scaffolds put in place to support their understanding and these will be gently removed once the concept has been fully understood. Furthermore, a higher attaining child, who grasps concepts quickly, they will be further challenged by deepen their knowledge of the same content through more demanding problems. Thus meaning there is no differentiation in the content or units being taught.

Additionally, children who are not yet fluent in their understanding should receive where possible same day intervention to secure and address gaps/misconceptions before moving on. Here we focus on the 'keep-up' not 'catch-up' approach.

The lowest 20% of learners in all classes are monitored and interventions are put into place to support these pupils. After formal assessments are completed, the Maths Lead asks for a list of children in each class who have fallen into the lowest 20% and interventions and practice put in place to support these children should be outlined. The Maths Lead will keep an eye on these children to ensure appropriate support is in place and gaps are closed. Additionally, the Maths Lead will focus on whether the same children remain in the lowest 20% across the year and the reasons why. Assessment data and well as on-going assessment in the classroom daily is used to support these learners.

## **Assessment, Recording and Reporting**

- Assessment is regarded as an integral part of teaching and learning and is a continuous process. It is the responsibility of class teachers to assess all children in their class. Overall, the Head Teacher, SLT and Maths Lead will also monitor progress of all children in all classes, year groups and across the whole school.
- Assessments take place at three connected levels: day to day, periodic and transitional. These assessments are used to inform teachers in a continuous cycle of planning, teaching and assessment.
- Day to day assessments are an informal part of every lesson where children's knowledge and understanding is informally assessed in class through questioning, observations during lessons as well as in live- marking written work. Teachers use these assessments to plan further work. The effective assessment for learning (AFL) practice is integral to this.

Periodic assessments take place termly using the level descriptors from Target Tracker and the National Curriculum objectives. The school uses the assessment bands and steps from the Target Tracker in Year 1 and 2. Interim Frameworks are used in Year 2 to make final judgements at the end of KS1. The teachers use these assessments to monitor the progress made by the individual children, identify gaps in the learning as well as next steps for future planning.

- Transitional assessments take place towards the end of the school year to assess and review pupils' progress and attainment. The outcomes from these assessments are then passed on to the child's next teacher in order to support any gaps in learning and specific needs to be addressed individually or in a small group.
- We recognise children record their learning in a variety of ways. We also believe that feedback to pupils is very important, as it tells them how well they have done and what they need to do next in order to improve their work. Verbal Feedback is given throughout each lesson and this is recorded using VF. Additionally, Next Steps are given where appropriate to aid and support the children in their learning and VR is used to show when a child has verbally reasoned. (See Marking Policy).
- Parents are kept informed of their child's progress through 'open evenings/parents evening', End of Year Targets and End of Year Reports.

### **Monitoring and Evaluation**

The Maths subject leader will monitor Maths planning and support if required. The Maths subject leader along with the headteacher, monitors the teaching through lesson observations and 'drop-ins' in order to ensure effective teaching, learning, continuity and progression in the school. It is the role of the Maths Lead supported by SLT to support staff in the approach, planning and teaching of Maths as well as regularly updating staff on changes and adaptations made throughout the Maths Curriculum and structure of lesson design in our school.

Whole school work scrutiny is done to ensure consistency of high standards and progression within and between year groups. Also to ensure equal opportunities are given to all of our pupils. All staff meets at least once a year to review samples of pupils' work from each class/set to ensure that judgements about levels are consistent across the school.

### **Parental Involvement**

At William Austin Infant school we encourage parents to be involved by

- Inviting them into school termly to discuss the progress of their child.
- Inviting them to curriculum evenings or circulating information via half-termly newsletters when significant changes have been made to the mathematics curriculum.
- Holding workshops for parents focusing on areas of mathematics.
- Providing parents with End of Year Targets which contain the objectives the children need to secure to reach their target.
- Providing Parents with an End of Year Report, highlighting what the children can do fluently and their next steps.
- Homework activities that link to the current weeks learning. These tasks are to be completed by or with the child.

### **Resources and the Learning Environment**

All classrooms have a wide range of appropriate resources, in particular a number focus, and central stock is available in the Maths cupboards in the staffroom. A range of software is available to support work with the computers and interactive whiteboards. All staff have their own log in details for White Rose Maths to aid and support them in planning. Teachers have the opportunity to request stock from Maths subject leader.

#### **Learning Environment**

We thrive to create a safe, engaging and supportive learning environment for all our children. In each classroom there is a Maths display board used and designed as a working wall. This should be regularly updated to reflect the current teaching and learning taking place within the

classroom. It should be used as an aid to support our children and a resource they can continually refer to. As a non-negotiable all Maths Working Walls should include:

- Main learning focus E.g. Fractions
- STEM Sentences
- Key Vocabulary
- Resources and Manipulatives that may support the children
- Maths Journey
- Modelled work from lessons- CPA approach clearly evident.
- Examples of the 'Five Big Ideas' when and where covered in lessons.

### **Review Procedures**

This policy will be reviewed as part of the schools planned programme.

The next planned review will be in 2027 unless there are national changes to requirements.