

Mathematics Policy

November 2021



Maths policy reviewed: November 2021

Next review: November 2023

Introduction Mathematics is a creative and highly inter-connected discipline that has been developed over centuries, providing the solution to some of history's most intriguing problems. It 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. (National Curriculum 2014)

Curriculum Intent

Our curriculum intent is to provide a progressive and challenging curriculum, which is meaningful, relevant and enjoyable and develops skills for lifelong learning. It is based on the National Curriculum as a minimum entitlement, but in order to ensure learning is as engaging as possible, teachers are given the flexibility to follow the children's strengths and interests, as well as their own. Wherever possible, enrichment activities (educational visits, visitors to school, interactive resources etc.) are used to capture and 'grow' children's interest in the topic. Where appropriate, units of work should plan to explore an in-depth theme / themes rather than attempt to cover a wide range of aspects, without any in-depth foci. We recognise that there is no upper ceiling on what children can learn and where appropriate, children's learning should be extended over and above National Curriculum requirements, especially when following their own interests.

Mathematics is very important in everyday life and, with this in mind, the purpose of Mathematics at Willington Primary School is to develop an ability to solve problems, to reason, to think and work systematically, logically and accurately. When teaching mathematics at Willington Primary School, we intend to provide a Maths curriculum which caters for the needs of all individuals and promotes the necessary skills and knowledge for life-long learning. Whilst the programmes of study are organised into different topics, the children are encouraged to make links between these in order to understand how the subject is interrelated. All children are challenged and encouraged to do their best and succeed in Maths using fluency, reasoning and increasingly challenging problems and puzzles. New mathematical concepts are introduced using a 'Concrete, Pictorial and Abstract' approach. This enables all children to experience hands-on learning when discovering new mathematical topics, therefore allowing them to have clear models and images to aid their understanding. Arithmetic and basic mathematical skills are practised daily to ensure key mathematical concepts are embedded and children can recall this information to see the links between topics in Maths. Progress of the pupils is always based on the security of their understanding and their readiness to progress to the next stage of their learning. Pupils who grasp concepts rapidly are challenged through being offered rich and sophisticated problems before any acceleration

through new content. Those who are not sufficiently fluent with earlier material consolidate their understanding, including through additional practice.

Implementation

Maths at Willington Primary School is taught using the White Rose Maths overview and plans, alongside the DfE Ready to Progress material. These are supported with a wide range of other resources, including (but not exclusively) I See Reasoning, I See Problem Solving, nRich problems, NCETM resources and Primary Stars resources. Maths topics are taught using small steps and children only move onto the next topic once they are secure in their current learning. Mathematical fluency skills are taught daily. These focus on key skills including arithmetic, number bonds, times tables and their related division facts, place value, the four operations and fractions. A range of reasoning resources are used to challenge all children and give them the opportunity to reason with their understanding. These are integrated within the lessons to enable the children to think deeper about their mathematical learning. Teachers use assessment for learning techniques to develop their own understanding of which children have attained the required level of understanding in the lesson, and which children need further support in their learning. Interventions are used as soon as possible to support children to ensure children are ready for their next Maths lesson. These are carried out by either the class teacher or a teaching assistant. Throughout the school, children are taught through either targeted differentiated small groups or mixed ability whole class lessons. Within the EYFS, children learn their maths through a continuous provision approach with the guidance of both the EYFS teacher or teaching assistant. Throughout the school, lessons use the 'Concrete, Pictorial and Abstract' approach to guide children through their understanding of mathematical processes. A wide range of manipulatives and pictorial representations are used at appropriate stages throughout the pupils' journey through the school and according to the topic being taught. Regular problem solving lessons are planned as a way to revisit previous learning and apply their understanding when solving real life problems. These are taken from a variety of sources, and may be either integrated within the main lesson as a short activity, or as a longer, more in-depth activity. Pupils use Numbots (KS1) or Times Table Rock Stars (KS2) little and often as part of their mathematics homework to further develop and embed their fluency skills. These resources are also used regularly within their class. Where possible, links are made with other subjects across the curriculum, for example in Science when recording information in experiments, and History when drawing timelines.

Impact

As a result of our Maths teaching at Willington Primary School, the children are engaged in their maths work and are challenged. The children feel confident to

'have a go' within their maths lessons, understanding that if they do not get the correct answer, this is OK so they can further develop their understanding. They are confident learners who can talk about Maths and their learning and the links between Mathematical topics. The lessons that are taught use a variety of manipulatives and/or visual representations to support learning. Work in the children's books show a mixture of fluency, reasoning and problem solving tasks, with increasing written explanations further into Key Stage 2. Within lessons, different representations of mathematical concepts are taught to promote variation within the subject. Learning is monitored daily through ongoing verbal feedback with the children and is assessed through both formative and summative assessments, which is monitored to ensure all children make good progress.

The aims of the 2014 National Curriculum in Mathematics are for our pupils to:

- Become fluent in the fundamentals of mathematics through varied and frequent practice with complexity increasing over time.
- Develop conceptual understanding and ability to recall and apply knowledge rapidly and accurately.
- Reason mathematically; follow a line of enquiry, conjecture relationships and generalisations.
- Develop an argument, justification and proof by using mathematical language.
- Problem solve by applying knowledge to a variety of routine and non-routine problems. Breaking down problems into simpler steps and persevering in answering.

We aim to develop a mastery curriculum through the 'NCETM Big Five Ideas': coherence, mathematical thinking, representation and structure, fluency and variation. We achieve this through the aims above.

The National Curriculum sets out year-by-year programmes of study for key stages 1 and 2. This ensures continuity and progression in the teaching of mathematics. The EYFS statutory Framework 2014 sets standards for the learning, development and care of children from birth to five years old and supports an integrated approach to early learning. This is supported by the 'Development matters' non statutory guidance.

In the EYFS, the Statutory Curriculum Guidance for the Early Years Foundation Stage is taught so that the area of learning for mathematics covers the following areas:

- develop and improve their skills in counting

- understand and use numbers
- calculate simple addition and subtraction problems
- describe shapes, spaces, and measures

The purpose of mathematics in our school is to develop:

- positive attitudes towards the subject and awareness of the relevance of mathematics in the real world
- competence and confidence in using and applying mathematical knowledge, concepts and skills
- an ability to solve problems, to reason, to think logically and to work systematically and accurately
- initiative and motivation to work both independently and in cooperation with others
- confident communication of maths where pupils ask and answer questions, openly share work and learn from mistakes
- an ability to use and apply mathematics across the curriculum and in real life
- an understanding of mathematics through a process of enquiry and investigation

We aim to provide a stimulating and exciting learning environment that takes account of different learning styles and uses appropriate resources to maximise teaching & learning.

Breadth of study

Careful planning and preparation ensures that throughout the school children engage in:

- practical activities and games using a variety of resources
- problem solving to challenge thinking
- individual, paired, group and whole class learning and discussions
- purposeful practise where time is given to apply their learning
- open and closed tasks
- a range of methods of calculating including mental and pencil & paper methods.
- working with computers as a mathematical tool

Through our creative approach to teaching and learning, we also seek to explore and utilise further opportunities to use and apply mathematics across all subject areas.

Teachers' planning and organisation

Long-term planning

The National Curriculum for Mathematics 2014, 2020 Development Matters and the Early Learning Goals in the Early Learning Goals statutory framework provide the long-term planning for mathematics taught in the school.

Medium-term planning

Reception and Years 1-6 use the White Rose Maths Hub sequences of learning as their medium-term planning documents. These sequences provide teachers with exemplification for maths objectives and are broken down into small steps for fluency, reasoning and problem solving - the key aims of the National Curriculum. They support a mastery approach to teaching and learning and have number at their heart. They ensure teachers stay in the required key stage and support the ideal of depth before breadth. They support pupils working together as a whole group and provide plenty of time to build reasoning and problem solving elements into the curriculum. Teachers use other resources such as the NCETM reasoning resources, I See Reasoning and nRich resources to supplement the White Rose scheme of learning, thus ensuring greater depth can be achieved. Due to unforeseen circumstances, such as the Covid-19 pandemic, adjustments to both long term, medium term and short term planning are carried out based on the needs of the children in each cohort.

Short-term planning

The above sequences of learning support daily lesson planning. Lessons are planned using individual teacher's planning format and are monitored at intervals by the mathematics subject leader. EYFS planning is based on the medium-term plans and delivered as appropriate to individual children with thought to where the children are now and what steps they need to take next.

All classes have a daily mathematics lesson where possible. In Key Stage Two, these are 60 minutes each day.

Teachers in the EYFS ensure the children learn through a mixture of adult led activities and child initiated activities both inside and outside of the classroom.

Mathematics is taught through an integrated approach.

In Key Stage One, lessons are taught each week which equate to a total of five 45-60 minute sessions per week.

Special educational needs & disabilities (SEND)

Daily mathematics lessons are inclusive to pupils with special educational needs and disabilities. Where required, children's pupil passports incorporate suitable objectives from the National Curriculum for Mathematics or Development Matters

and the Early Learning Goals and teachers keep these in mind when planning work. These targets may be worked upon within the lesson as well as on a 1:1 basis outside the mathematics lesson.

Maths focused intervention in school helps children with gaps in their learning and mathematical understanding. These are delivered by trained support staff and overseen by the SENCO and/or the class teacher.

Within the mathematics lessons, teachers have a responsibility to not only provide differentiated support to children with SEND but also activities that provide sufficient challenge for children who are high achievers. It is the teachers' responsibility to ensure that all children are challenged at a level appropriate to their ability. Children work in mixed ability groupings, as central to the mastery approach of learning, but children are challenged and supported as required to achieve a mastery understanding within the subject. This differentiation is based on deeper learning, reasoning and questioning, which is in line with the mastery approach to the teaching of mathematics.

Equal Opportunities

Positive attitudes towards mathematics are encouraged so that all children, regardless of race, gender, ability or special needs, including those for whom English is a second language, develop an enjoyment and confidence with mathematics.

The aim is to ensure that everyone makes progress and gains positively from lessons and to plan inclusive lessons. Lessons involving lots of visual, aural and kinaesthetic elements will benefit all children including those for whom English is an additional language (EAL) and those who have special educational needs.

Differentiated questioning is used in lessons to help children and planned support from Teaching Assistants and other adults.

Lessons

In all lessons, learning objectives and success criteria are discussed with the pupils. The emphasis in lessons is to make teaching interactive and lively, to engage all children encouraging them to talk about mathematics. Lessons involve elements of:

- Instruction - giving information and structuring it well;
- Demonstrating - showing, describing and modelling mathematics using appropriate resources and visual displays;
- Explaining and illustrating - giving accurate and well-paced explanations;
- Questioning and discussing;
- Consolidating;

- Reflecting and evaluating responses - identifying mistakes and using them as positive teaching points;
- Summarising - reviewing mathematics that has been taught enabling children to focus on next steps

Lessons will follow the mastery curriculum, ensuring a mixture of fluency, reasoning and problem solving throughout the whole week.

Pupils' Records of work

Children are taught a variety of methods for recording their work and are encouraged and helped to use the most appropriate and convenient. Children are encouraged to use mental strategies and their own jottings before resorting to more formal written methods. Children's own jottings to support their work is encouraged throughout all year groups. The progression for calculation methods throughout the school can be found as part of the calculation progression document.

Marking

Marking of children's work is essential to ensure they make further progress. Work is marked against the learning objective, in line with the school marking policy, using the whole class feedback books. Feedback is made as close to the previous lesson as possible, ideally at the start of the next lesson or within the actual lesson. Some pieces of work in mathematics can be marked by children themselves, for example exercises involving routine fluency with support and guidance from the teacher - particularly in Years 5 & 6.

Assessment

Assessment is an integral part of teaching and learning and is a continuous process. Teachers make assessments of children daily through;

- regular marking of work
- analysing errors and picking up on misconceptions
- asking questions and listening to answers
- facilitating and listening to discussions
- making observations

These ongoing assessments (assessment for learning) informs future planning and teaching. Lessons are adapted readily and short-term planning adjusted in light of these assessments. Each teacher is responsible for assessing the understanding of the skills and concepts taught. Assessments are used to inform future teaching,

learning and planning. Staff will give feedback in Mathematics in accordance with our Feedback policy.

Assessments of the pupils' mental calculations and their number fact recall is carried out in all classes from Year 1 through to Year 6 as part of the daily maths lessons and as part of daily Fluency in Five sessions throughout Key Stage 2.

Medium-term assessments

Two main assessments are carried out across the school using the assessment materials for each year group provided by the online GL assessments tests / Testbase and Twinkl arithmetic tests. These materials used alongside judgements made from class work support teachers in making an assessment for each child which, in line with the assessment policy, they enter onto the WPS Mathematics National Curriculum Statements within the Core Assessment Journey spreadsheet.

Teachers in years 1-6 track the detailed progress of all their children in mathematics against the NCETM Ready to Progress statements. The statements cover the mathematics objectives for the year group. This process of careful tracking adds to helping teachers form an assessment for each child. These are monitored by the Maths Co-ordinator and they are also sent to the next teacher at the end of the year. Attainment is also recorded termly on Insight Tracking to show whether each child is 'below', 'on track' or at 'greater depth'.

Progress of pupils is discussed throughout the year, including during pupil progress meetings, and appropriate intervention considered and put in place where appropriate. At the end of each year, a statement is written on the child's annual report, to explain topics that have been covered and to provide details of their child's attainment and effort.

End of Key Stage Assessment

Y2 and Y6 complete the national tests (SATs) in May. Years 3, 4 and 5 complete the GL online assessment tests which inform teacher summative judgements throughout the year and in the summer term.

Resources

Each key stage area has a stock of core resources that are age appropriate. This is available for use with all pupils in each class.

Role of the Maths Subject Leader

- To lead in the development of maths throughout the school.
- To monitor the planning, teaching and learning of mathematics throughout the school.
- To help raise standards in maths.
- To provide teachers with support in the teaching of mathematics.
- To provide staff with CPD opportunities in relation to maths within the confines of the budget and the School Improvement Plan
- To monitor and maintain high quality resources.
- To keep up to date with new developments in the area of mathematics

Mark Rodgers - Maths Subject Leader