Maths Policy

Owston Park Primary Academy

MATHEMATICS POLICY

INTENT:

The intent of our mathematics curriculum is to design a curriculum which is accessible to all and will maximise the development of every child's ability and academic achievement. We deliver lessons that are creative and engaging. We want children to make rich connections across mathematical ideas to develop fluency, mathematical reasoning and competence in solving increasingly sophisticated problems. We want the children to be able to communicate their ideas through mathematical language and be able to give clear and accurate explanations. We intend for our pupils to be able to apply their mathematical knowledge to science and other subjects. We want them to know that mathematics is essential to everyday life, critical to science, technology and engineering, and necessary for financial literacy and most forms of employment. As our pupils progress, we intend for them to be able to understand the world, have the ability to reason mathematically, have an appreciation of the beauty and power of mathematics, and a sense of enjoyment and curiosity about the subject.

	Intent	Implementation	Impact
Intention 1	**To build a Mathematic curriculum which develops learning and results in the acquisition of knowledge and skills so that all pupils know more, remember more and understand more.**	• Mathematics is planned for, following the EYFS Framework and KS1 and KS2 National Curriculum. • Mathematics is planned for following the scheme of work created by the Maths Subject leaders which includes all of the National Curriculum objectives for that year. • Whilst the National Curriculum forms the foundation of our curriculum, we make sure that children learn additional skills, knowledge and understanding and enhance our curriculum as and when necessary. • Mathematics is taught as an exclusive subject in order to promote fluency, but children are also provided with real life problems so that they are made aware of the importance of mathematics in everyday life. • National curriculum objectives are supplemented by a number of resources taken from Mathematics mastery and Ten Town. • Particular attention is paid to the Ready to Progress Criteria published June 2020. • Implementing the 'mastery approach' to teaching maths is the underlying principle of mathematics teaching to embed learning and develop that deeper understanding • Continuity and progression in maths throughout the school is ensured through a bespoke curriculum map and corresponding long term plans. • Daily Maths Meetings / times tables sessions take place every day from FS1 – Year 6. Maths Meetings take place in the morning. This is to allow children to recall facts quickly, improve mental strategies and apply their learning across all areas of mathematics. Repeated daily practice enables our children to build the skills to solve problems in the context of real life situations. Every class has a Maths Meeting board full of appropriate resources to teach this successfully.	Children will make at least good progress in Mathematics from their last point of statutory assessment or from their starting point in Nursery. Children will use their Mathematics knowledge and skills, in all curriculum areas, to enable them to know more, remember more and use more. Children will recognise the importance of Mathematics as a facilitating subject to enable them to access other areas of learning and operate successfully is everyday life both now and in the future.

Intention 2	**To build a curriculum, which enables pupils to make rich connections across mathematical ideas to develop fluency, mathematical reasoning and competency in solving increasingly sophisticated problems**	• The systematic teaching of number and place value has a high priority throughout school. • In Foundation Stage, pupil fluency is developed by using a visual, practical base to develop conceptual understanding and recall. Pupil's mathematical reasoning is developed through the use of concrete objects and spoken language to explain and justify. • School has developed a comprehensive Calculation Policy, which enables staff to teach standard methods systematically and progressively across all age groups. • Mathematics Mastery is used as a basis for a comprehensive curriculum. Coverage is ensured and real life opportunities for pupils to make connections and apply their mathematical knowledge are encouraged. • Our curriculum is cumulative - each school year begins with a focus on the concepts and skills that have the most connections, and this concept is then applied and connected throughout the school year to consolidate learning. This gives pupils the opportunity to 'master maths'; by using previous learning throughout the school year, they are able to develop mathematical fluency and conceptual understanding. • Daily Maths Meetings are held to ensure rapid recall and keep concepts taught previously at the forefront; this also allows children to make the links between mathematical concepts. • Every lesson should incorporate an element of reasoning and problem solving. This enables varied and frequent practice of mathematical application through increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately. • The systematic teaching of times tables ensures that children develop rapid recall which they can use as a tool to effectively and efficiently solve more complex problems. • All children from Year 2 upwards have access to Timetables Rockstars, which is a web-based ability-appropriate times tables programme, which children access at home and school. • All Year 1 children and children working at that curriculum age have access to Numbots to allow for regular and focused practice of basic skills. • Teachers will deliver lessons that are creative and engaging. • All children will have access to activities that allow them to deepen their understanding by representing concepts using concrete materials and by making connections between different representations • Children are taught in year groups. We believe that all pupils can attain highly in mathematics and every pupil will have different strengths and development areas, therefore groupings within classes are flexible and pupils will work in different groups dependent on their need.	Children will have a confident attitude towards mathematics. They will use arithmetic and times tables fluently and make connections in order to solve real life problems. They will recognise that Mathematics is essential for everyday life and make at least good progress in Mathematics from their last point of statutory assessment or from their starting point in Nursery. Children will use their Mathematics skills as a key tool in helping them to learn and, as a result, know more, remember more and understand more.

Intention 3	**To provide opportunities across all curricular areas for the development and application of Mathematic skills to help all pupils know more, remember more and understand more.**	• The promotion of mathematics is essential to the successful acquisition of knowledge across the curriculum. • Planned opportunities are made to use mathematical skills in other curriculum subjects • The promotion of opportunities to use and apply mathematical knowledge throughout school is planned in a variety of subjects set in real life contexts. • The promotion and implementation of outdoor learning and external cultural capital experiences provides additional opportunities for children to apply mathematical knowledge in real life situations.	Children will be able to produce mathematics work in all areas of the curriculum of a similar standard which evidence good progress from their last point of statutory assessment point or their starting point in Nursery Children will realise that Mathematics is essential to everyday life, critical to science, technology and engineering, and necessary for financial literacy and most forms of employment.
Intention 4	**To provide children with mathematical language and communication skills to enable clear and accurate explanations.**	• Classrooms are a language rich environment • The introduction of new vocabulary is made daily and displayed on the classroom Maths Meeting or maths wall. Teachers clearly define and model the use of the vocabulary introduced. • Talk Tasks are evident in all mathematics lessons and specifically planned for. This allows all children to orally rehearse their explanations and justify their reasoning. • Full sentence responses are expected in class lessons and maths meetings. • Teachers model and rehearse clear explanations. • In Foundation Stage, pupil's mathematical reasoning is developed through the use of concrete objects and spoken language to explain and justify. • The promotion of language will enable pupils to deepen understanding in order to describe their learning, communicate and record their ideas. • Children will be encouraged to ask and explore questions to deepen their knowledge.	Children will be able to use and understand the various mathematical terms and thus make good progress against National Expectations. Children will be able to explain and justify in all areas of the curriculum in the same way as in maths lessons.

PEDAGOGY

In Mathematics, like all other subjects, we recognise the importance of the methods and practice of teaching (the pedagogy) we choose to use in enabling pupils to know more, understand more and remember more. In Mathematics, the following approaches will be used, and be evident in pupil discussion, observations and work in books, in order to ensure that the learning opportunities and skill development are as effective as possible and that pupils progress throughout the year and across year groups during their maths experiences in school:

Teaching Sequence in Mathematics		Possible pedagogical approaches used in Mathematics		
	Daily Maths Meeting – fast-paced, revisiting concepts previously taught, no written evidence needed		**Behaviourism**	**Direct teacher instruction; modelling of skills and techniques; demonstration; split input delivery**
	'The Big Picture' – setting the mathematics learning that is about to take place within the chronology of pupil's maths learning and skill development to date. Starting with what the children know, understand, are able to do and able to say. Sharing of the Learning Challenge and Success Criteria, with links made to Metacognitive colours.		**Constructivism**	**Inquiry-based learning through skill development**
	Specify key vocabulary to be used and its meaning.		**Social Constructivism**	**Teacher modelling; questioning; mix of individual, paired and group instruction**
	Specify mathematical skills to be used and clearly model the expectations			
	'Talk Task' - Provide opportunities for the children to work interactively		**Liberationism**	**Pupil-led learning; opportunities and skill development**
	Response to assessments – children are to be secure in their knowledge before moved on to new concepts			
	Elements of fluency, reasoning and problem solving – variation should be embedded			
	Provide opportunities for children to critically review their own work and that of others. Individual reflection on the learning and mathematical skill development that has taken place.			

PLANNING – Y1-6

Curriculum Maps – These set out when each of the areas will be covered over the 3 terms.

Unit Plans – These plans give the NC objectives, vocabulary, ready to progress criteria and links to resources to allow a teacher to plan the relevant unit of work. There is an estimated number of days teaching time, but this is flexible to allow children to gain that deeper understanding. Teachers assess the pupils' starting points prior to adapting the learning in any given unit. The Unit plans also give the teacher an overview of:

- The pre-requisite skills and knowledge that pupils should bring from prior learning (either earlier in this academic year or from the previous academic year);
- The potential gaps in learning of the cohort, based on AfL, transition information from the previous teacher or if pupils have come from another school;
- What common difficulties and misconceptions are associated with the learning within the unit.

Short term plans- These plans list the specific learning objectives that will be covered in each lesson. Learning tasks are selected by the teacher to suit the need of the pupils using suggestions from the Maths Mastery website. These plans should ensure that the maths lessons are:

- well structured, lively and delivered at a good pace
- structured to embed mathematical understanding through concrete, pictorial and abstract representation.
- Encourage the use of specific mathematical vocabulary
- Encourage the use of talk partners and feature discussions and explanation as children are encouraged to explore their own and others' ideas, as an essential part of the learning process. Pupils will be encouraged to ask, as well as answer, mathematical questions.
- Encourage independent learning whenever appropriate.
- Provide the mathematical challenge through tasks and questioning which provides depth for all pupils
- Provide variation to broaden the children's exposure to the learning objectives in a wide range of context to ensure deeper understanding of concepts.
- Differentiate the teaching, questioning and level of support so that the children are all working towards the same learning objective appropriate to their age group.
- Ensure that all the maths equipment that could and might be used is available for the pupils. The pupils will decide what equipment they might use to tackle the challenge and will collect these resources as needed. This will encourage the pupils to think through the process of solving the challenge or problem and minimise wasted learning time.
- Provide an emphasis on pupil's learning beginning with practical examples leading onto informal jottings and mental strategies, and finally to formal representations as laid out for year groups in the calculation policy.

Class teachers are responsible for the content of the maths sessions although they may be delivered by a different teacher, HLTA or TA. Should a teacher not teach a maths lesson (perhaps due to PPA or professional development opportunities), the class teacher remains responsible for the effective delivery of the learning outcomes and must ensure sufficient time for the person covering to become familiar with the planning and expectations for the lesson.

Similarly, the class teacher is responsible for ensuring that those pupils who display a particular gift for mathematics or/and achieve at a level higher than expected for their age are appropriately challenged and supported to maximise their progress. This will include the provision of different, more appropriate work rather than 'differentiation by exhaustion' whereby pupils are simply expected to do more of the same.

DIFFERENTIATION

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. The questioning and scaffolding individual pupils receive in class, as they work through problems, will differ and pupils who grasp concepts rapidly are challenged through more demanding problems which deepen their knowledge further.

Formative assessment should be used through the lesson to identify children who need support or challenge. Challenge can be achieved through more demanding problems which deepen their knowledge of the same content. Pupils' difficulties and misconceptions are identified and addressed with rapid intervention – commonly through individual or small group support later the same day: there are very few "closing the gap" strategies, because there are very few gaps to close.

INCLUSION

Within most class groupings, there may be children who are working significantly above or below the level of their peers. The learning objective must be differentiated to take into account their bespoke targets ensuring challenge so that individual progress is made. Reasonable adjustments can be made to their tasks or level of support. Advice can be sought from the school's SENCO where applicable.

Children with SEN are be supported to access maths through focused provision mapping and appropriate targets on Support Plans.

EARLY YEARS FOUNDATION STAGE (EYFS)

Mathematics teaching in EYFS begins with a focused adult-led session with direct teacher input and has high language expectations. The teacher and TA role model the Talk Task for pupils. Adults then plan the indoor / outdoor continuous provision to enable pupils to explore the key learning from the unit through child-initiated play throughout the indoor and outdoor provision.

MANIPULATIVES

All classes have some basic maths equipment appropriate for the age group. Children will have the opportunity to use a wide range of resources consistently throughout school (N – Y6). Manipulatives such as Numicon, 10's frames, 2 coloured counters, base 10 materials, bead strings, pattern blocks, bar modelling resources, number lines, number tracks and number squares will support conceptual understanding for all pupils.

LEARNING ENVIRONMENT

The environment should be balanced with both Literacy and Numeracy resources being both eye catching and appropriate to the age of the children. In each class there is a maths meeting board. This is not a permanent display and is added to for the purposes of modelling teaching. This wall is used by children to support their learning. Displays may include concrete and pictorial apparatus to help support children to grasp concepts and mathematical vocabulary. Pupils' work displayed in classrooms will be used to encourage a positive attitude and enthusiasm towards the mathematics.
All classrooms have access to an interactive whiteboard. This should be incorporated into most Maths lessons through the use of teaching slides and content.

ASSESSMENT

Children are set individual targets at the beginning of each year and progress towards them is regularly reviewed, each term, throughout the year.

Formative Assessment (AfL) – (monitoring children's learning)	Summative Assessment – (evaluating children's learning)
Assessment is an integral and continuous part of the teaching and learning process and much of it is done informally as part of each teacher's day-to-day work. Teachers integrate the use of formative assessment strategies such as: → effective questioning → clear learning objectives → the use of success criteria → effective feedback and response in their teaching → observing children participating in activities.	More formal methods are used to determine the levels of achievement of children at various times during the school year. Summative tests are used termly. A scaled score is recorded. They allow the school to measure each child's attainment in all areas of mathematics, and compare this with an "average" for children of that age. The results are used to monitor individual's progress in year and year-on-year. These termly assessments are used throughout the year to aid planning. In addition, the children of Yr2 and Yr6 complete the Statutory End of Key Stage Assessment.

Findings from these types of assessment are used to inform same day interventions, challenge and future planning. Planning should be annotated and those who need more support, must be identified on plans through use of AfL This plan, assess, review cycle ensures that misconceptions are identified and steps are put in place to support these learners. From this information, staff plan the next steps to learning. Staff **must** ensure children have a solid basis of that aspect of learning before moving onto new concepts. **Do not** move on until most children do. For those who do not have this solid basis, then interventions in small groups should be used to ensure they do. For those who securely understand the concepts, ensure children can use and demonstrate the skills in a wide variety of contexts and problems (greater depth).	We use termly assessments as a way of recording children's progress in objectives covered across that specific term. This information is then submitted to the Assessment Leader. Any summative assessments must be followed by an analysis of the results. The QLA should inform next steps in teaching and identify any gaps which should be addressed through keep-up, catch-up sessions.

MARKING AND FEEDBACK

Pupils' work will be marked in line with the Marking Policy and will model how corrections should be made, giving pupils a chance to learn from their misconceptions or incorrect methods.

- Marking should always be focused on the Learning Objective
- Children to self-assess their work when appropriate
- Peer assessment should be used where appropriate.
- Children should always be given chance to read and respond to comments made
- Wherever possible, the checking or marking of work will be done with the child who will be given the opportunity to ask questions and self-correct (green pen.)
- Corrections requested should be followed up by pupils and then checked by staff
- All work to be marked/acknowledged by class teacher or teaching assistant in a timely manner (before next lesson)
- Number formations issues ALWAYS to be picked up in marking and feedback for corrections.
- If verbal feedback is given during the lesson, the initials VF will be noted in the child's book.

PRESENTATION

- The numerical date will be placed on the top line of the top right-hand corner of the page with the day, month and year e.g. 19.01.21 (Key Stage 1 and 2)
- A line will be left after the date before the learning challenge will be written underneath or stuck in (Key Stage 1 and 2)

- Maths work to be written as one number per square

SMSC

Through various projects, mini investigations and activities built into lessons, SMSC, (Spiritual, Moral, Social and Cultural) is being delivered through maths lessons.

Spiritual development	**Moral** development	**Social** development	**Cultural** development
→ Understanding how Mathematics relates to the world around them → The skill of analysing data enables children to make sense of the vast amounts of data available in the modern world and around them → Develop a fascination about how currency can be used in everyday lives → Learning life skills such as telling the time, reading measurements and scales are taught in exciting contextual lessons → Explore shapes in the world around them and talk creatively using mathematical language → Understanding of patterns and sequences in everyday life.	→ Recognise how logical reasoning can be used to consider the consequences of particular decisions and choices → Explore a range of mathematical investigations where they are challenged and made aware that there may be more than one solution → Proving or explaining whether an answer is right or wrong. This helps them learn the value of mathematical truth → Mathematical reasoning can be developed by group work where the children are encouraged to talk about their learning and listen to others' viewpoints → Look at moral issues raised from a question and will investigate, often using statistics to find an answer	→ Problem solving skills and teamwork through creative thinking, discussion, explaining and presenting ideas → Work together productively on mathematical tasks → Experimental and investigation work where children are encouraged to work collaboratively → Work collaboratively when completing outdoor learning tasks → Self and peer reviewing are very important to enable pupils to have an accurate grasp of where they are and how they need to improve.	→ Begin to get a sense of number systems around the world → Recognise that mathematicians from many cultures have contributed to the development of modern day mathematics → Counting and explore early counting ideas from other countries such as tallies → Explore more developed number systems such as Roman numerals, imperial and metric measurements → Realise how the counting system has developed through the ages and shaped the decimal system we use today → Exploring Mathematics applied in different cultures such as Rangoli patterns, symmetry, tessellations and Islamic geometric patterns. → Application of math skills to exchange rates for foreign travel.

LEADERSHIP AND MANAGEMENT

Subject Leaders Role:	**How this will be achieved:**

→ to empower colleagues to teach maths to a high standard and to support staff in the following ways → to keep up-to-date on current issues through appropriate CPD; disseminating relevant information and providing training for staff members (either directly or through other professionals) → to have a knowledge of the quality of mathematics provision across the school → to identify and act on development needs of staff members → to monitor expectations, provision and attainment across the school and providing feedback to develop practice further in order to raise standards. → To provide necessary equipment and maintaining it to a high standard. → To have a clear picture of the attainment and progress of pupils in maths → To have an honest understanding of the pupil's response and attitude to Maths and the quality of work produced.	→ Classroom observation of Maths, including learning walks, with written feedback → Questioning of children during these observations → Discussions with pupils → Carrying out regular scrutiny of work, and feeding this scrutiny back to teachers → Looking at Maths displays in classrooms and corridors. → Monitoring each teacher's Maths planning, as appropriate, and providing written feedback. → Keeping all staff informed on changes that effect Maths in school. → Attending any Maths Subject Leader meetings arranged by the Trust or LA.

MATHS NON-NEGOTIABLE EXPECTATIONS

- All work to be dated with the small number date.
- Learning Objectives taken from the National Curriculum
- Learning Challenge and Success Criteria to be discussed and shared with children
- Learning challenge to be clear on all work (perhaps glued in for younger or less able pupils or written on activity sheet)
- Good presentation to be insisted upon. 1 number per square for all calculations. Writing as per writing expectations.
- Times tables practised daily and assessed once a week following new order. Ladders should be up in new order also.
- Marking to follow school marking policy
- Maths Meeting Board to be evident in every classroom in order to support maths learning in accordance with the school learning environment policy. This should reflect the teaching sequence at the time of delivery.
- Layout to be modelled and appear on MM board or working wall.
- Maths should be taught through 'topic' where possible.
- Maths calculation strategies to be taught as per the school calculation policy
- Language and vocabulary should be age-appropriate in discussions and used by adults and children
- Correct use of basic skills to be maintained when recording work

- Wherever possible Teaching Assistants support individuals, pairs or groups of children in all aspects of the lesson
- Individual whiteboards are to be used as a tool for rehearsal only; evidence of work should be in books.
- Use of photographs to evidence other learning.