Oswald Road Primary School
Subject Intent Statement

MATHS

What are the aims and purpose of this subject?

Maths at Oswald Road follows the National Curriculum and it is the aim that by the time children leave our school they are competent at age related expectations in number/place value; addition and subtraction; multiplication and division; fractions, decimals and percentages; ratio and proportion; algebra; graphs and statistics; measurement; geometry: properties of shape; and geometry: position and direction.

We also aim to ensure the children get varied opportunities to apply their knowledge to fluency, problem solving and reasoning style questions.

We aim to challenge the children mathematically and to also build a secure base of basic skills that the children can draw upon. We aim for the children to be mathematically agile, allowing them to apply their mathematical knowledge to a range of questions. Within our school vision, we want our children to leave us as aspirational, resilient and independent learners. Our aims within in our maths curriculum, ties in neatly with these three aims: stretch within the curriculum supports both aspiration and resilience and developing strength within basic skills allows for independence within learning.

We aim to ensure all our SEND children access maths at an appropriate pitch (both for challenge and support) and have full access to the curriculum. This means they access the fluency, problem solving and reasoning elements. We are aspirational for all children.

We understand from a young age, a level of speech and language is needed to develop in mathematics and therefore we also understand that supporting developing children's speech can support a development in their mathematics.

It is also our aim to allow children to feel confident in maths. Over time we have challenged the "I'm no good at maths" attitude that can sometimes be seen in our community. We have done a lot of work on this and seen a lot of positive impact with a now mainly positive attitude towards maths. One way that did successfully address this was the impact of wider curriculum linked maths on girls' attitude towards maths – with them offering it was because it didn't feel 'as right and wrong' when doing it linked to topic. We now follow the White Rose scheme of work and the move from the curriculum being 'fluency heavy' has supported this further. One thing we have also worked on is our aim to develop our children's (especially boys) attitude towards reasoning – developing that resilience to keep working towards 'water tight' reasoning.

We also aim to provide a stimulating environment and adequate resources and opportunities so that pupils can develop their mathematical skills to their full potential.

Our curriculum has the same purpose as set out within the National Curriculum: *Mathematics is a creative and highly interconnected 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.*

Equally our aims are as set out within the National Curriculum: *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*

Mathematics is an interconnected subject in which pupils need to be able to move fluently between representations of mathematical ideas. The programmes of study are, by necessity, organised into apparently distinct domains, but pupils should make rich connections across mathematical ideas to develop fluency, mathematical reasoning and competence in solving increasingly sophisticated problems. They should also apply their mathematical knowledge to science and other subjects.

*The expectation is that the majority of pupils will move through the programmes of study at broadly the same pace. However, decisions about when to progress should always be based on the security of pupils' understanding and their readiness to progress to the next stage. Pupils who grasp concepts rapidly should be challenged through being offered rich and sophisticated problems before any acceleration through new content. Those who are not sufficiently fluent with earlier material should consolidate their understan*ding, including through additional practice, before moving on.

What are the National Curriculum requirements for this subject?

We have clear mapping for number/place value; addition and subtraction; multiplication and division; fractions, decimals and percentages; ratio and proportion; algebra; graphs and statistics; measurement; geometry: properties of shape; and geometry: position and direction. Areas are broken down into a range of elements so it is really clear what is expected within each year group.

As per the Statutory Education Programmes for Early Years, the main focus is:

Developing a strong grounding in number is essential so that all children develop the necessary building blocks to excel mathematically. Children should be able to count confidently, develop a deep understanding of the numbers to 10, the relationships between

them and the patterns within those numbers. By providing frequent and varied opportunities to build and apply this understanding - such as using manipulatives, including small pebbles and tens frames for organising counting - children will develop a secure base of knowledge and vocabulary from which mastery of mathematics is built. In addition, it is important that the curriculum includes rich opportunities for children to develop their spatial reasoning skills across all areas of mathematics including shape, space and measures. It is important that children develop positive attitudes and interests in mathematics, look for patterns and relationships, spot connections, 'have a go', talk to adults and peers about what they notice and not be afraid to make mistakes.

We also understand the Early Learning Goals for the end of Reception as:

Number ELG
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.

Numerical Patterns ELG
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.

As per the National Curriculum, In Years 1 and 2, the main focus of mathematics teaching in is to ensure:

- pupils develop confidence and mental fluency with whole numbers, counting and place value. This should involve working with numerals, words and the 4 operations, including with practical resources.
- work is done on comparing and sorting shape, with related vocabulary
- work on using a range of measures to describe and compare different quantities such as length, mass, capacity/volume, time and money.

We understand that as children leave Year 2 they need to be secure with their number bonds to 20 and have an understanding of place value.

As the children move into Lower Key Stage 2, the main focus becomes:

- ensuring that pupils become increasingly fluent with whole numbers and the 4 operations, including number facts and the concept of place value. This should ensure

that pupils develop efficient written and mental methods and perform calculations accurately with increasingly large whole numbers.
- to develop their ability to solve a range of problems, including with simple fractions and decimal place value.
- to 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.
- to ensure that they can use measuring instruments with accuracy and make connections between measure and number.

We understand that 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.

By Upper Key Stage 2, the main focus of mathematics teaching is to:

- ensure that pupils extend their understanding of the number system and place value to include larger integers. This should develop the connections that pupils make between multiplication and division with fractions, decimals, percentages and ratio.
- 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. With this foundation in arithmetic, pupils are introduced to the language of algebra as a means for solving a variety of problems.
- provide teaching of geometry and measures that consolidates and extends knowledge developed in number.
- ensure that pupils classify shapes with increasingly complex geometric properties and that they learn the vocabulary they need to describe them.

We understand that by the end of year 6, pupils should be fluent in written methods for all 4 operations, including long multiplication and division, and in working with fractions, decimals and percentages. Pupils should read, spell and pronounce mathematical vocabulary correctly.

How is this subject's curriculum organised?

Maths is taught as a discrete subject. We teach maths daily and this is usually within the morning slot which we find is a better time for our children to apply themselves to mathematics. In addition, there are some maths links across the curriculum to maximise the opportunities to explore maths where relevant and purposeful. For example: graphs within science; symmetrical paintings in art and design; measuring accurately in design and technology; mathematical skills needed to code in computing. Opportunities to explore maths through other subjects are sought to ensure children are able to experience maths in a real-life context and differing contexts; enabling them to see its value and relevance and successfully apply their learning.

Our curriculum is sequential and organised into number/place value; addition and subtraction; multiplication and division; fractions, decimals and percentages; ratio and proportion; algebra; graphs and statistics; measurement; geometry: properties of shape; and geometry: position and direction. Each area builds on prior learning and via our mapping it is clear as to what prior knowledge is needed ahead of starting to teach a particular objective or unit. It is also

clear specifically what learning is needed to support not running on too far and jeopardising secure learning. Basic skills are worked upon daily to ensure our children can apply their mathematical knowledge to a range of questions and to ensure knowledge and skills remain fresh and truly sticks, with rapid recall. As well as fluency, there is a strong emphasis on improving perseverance by developing their reasoning and problem solving skills in a variety of practical, visual and abstract contexts to enable them to deepen, master and explain their understanding.

We use the 'White Rose' scheme for maths that enables us to teach maths in concrete, pictorial and abstract models which helps to scaffold their learning of each mathematical concept, visualise and manipulate number, shape, data and measure in a variety of ways and create deeper mathematical thinking for our children. We use White Rose mainly, supplementing in small amounts where appropriate (eg for additional fluency work). We use White Rose work books throughout school from spring term Year 1. Reception and Year 1 follow White Rose throughout the full year and Year 1 makes more use of following the planning, with less use of the written questions / worksheet elements in the first term. Nursery follow the Master the Curriculum scheme, we have found this scheme links closely with White Rose to best prepare the children for Reception.

We ensure our SEND children access maths with the appropriate level of challenge and support. All SEND children (unless working below Reception level) access White Rose.

All of our SEND children (and within our Universal Offer) have access to the appropriate manipulatives and there is also the expectation there will be appropriate and well-considered visuals. Re-visiting prior learning is critical. Currently we have Targeted Learning Models in Year 2 up to Year 6. In Early Years and Year 1, support is directed to ensure full access to learning.

Some SEND children (SEND support pupils) need further careful consideration around what is needed to be re-visited in more detail. For some SEND support children, there will be a more tailored approach (most often within the Targeted Learning Model) and it is understood that overlearning is often vital. Splitting some mathematical concepts into smaller chunks is also a strategy that is used, alongside the use of questioning to enable.

Our most complex SEND children (Pupils with an EHCP) have 1:1 support, small groups or a SEND model, with access to the White Rose curriculum at the appropriate year group stage. Some pupils with an EHCP may have further intervention, such as 'Power of 2', where needed to further supplement the maths curriculum.

Within lessons we make use of explicit modelling – both at the beginning of sessions and with smaller groups and individuals throughout sessions. Lessons also have an element of guided questions to allow the class or groups to work through a question in detail to support their understanding. From this, the children get opportunities to work independently on questions, in pairs and in groups. Reasoning and problem solving activities are more structured and modelled in Key Stage 1, to help the children build skills they will be able to apply independently as they progress up the school. Within most sessions in Key Stage 1 and 2, there are opportunities for fluency, problem solving and reasoning questions.

Feedback forms an important part of the sessions. Children will check their own fluency questions and have chances to amend errors. Feedback from teachers is timely across the lesson. Teachers mark reasoning questions and guide the children to add further detail to

their reasoning or to give a more solid answer. Teachers see errors via work around the classroom in the lessons and looking at the children's books. This allows to pick up on any issues when a child is checking their own work.

A focus is placed on teaching mathematical vocabulary to enable children to develop the skill of explaining their thinking in a clear and concise way and also to ensure children fully grasp the concepts. At the beginning of each unit, the teachers do a run through of the vocabulary and it is reiterated throughout daily teaching.

We use Times Tables Rockstars from Year 2 upwards to support quick and accurate recall of the times tables. We also use activities such as 'Super Movers', muddled up times tables question sheets, quick recall and games to encourage speed and accuracy.

We are all clear that the method of little and often is important to support retention. We find supplements to White Rose, such as Target Maths, a useful way for the children to re-visit regularly.

We have invested in a maths team – it consists of four members of staff: Headteacher, Assistant Head (experienced in Key Stage 1 and 2), UPS teacher (experienced in Year 2 and Key Stage 2) and UPS teacher (experienced in Early Years and Year 1). This allows for maths to be driven forward at all times – even when it is not a priority on the School Improvement Plan. A member of the team attends termly maths cluster meetings to ensure we remain up to date on new initiatives and that we can involve ourselves in professional dialogue with other schools. The team also accesses external training as appropriate.

In the Early Years Setting, we immerse the children in number. Through play, they see number in every area of the Foundation Stage classroom. They have daily opportunities to be involved in mathematics – via carpet teaching time, group work and challenges within the environment. There are well-planned activities and also an emphasis on independence and self-initiated learning, which enables foundation stage children to freely explore resources and pursue their own mathematical talents and interests. Children are shown that maths is seen and represented in everyday life in lots of ways. They are exposed to mathematics in different ways through discussions around times of the day to seeing mathematics in books and stories as well in role play and group activities in the provision. For example, sharing resources fairly with peers when building models and discussing size, height, shape etc. To deepen learning, children are taught and encouraged to use mathematical vocabulary when discussing their activities and in role play.

Assessment:

In Early Years, our children are assessed as 'Expected' or 'Working Towards'. The teachers make termly judgements as to where the children are working in both Number and Numerical Patterns, from evidence they have seen from Development Matters, Nursery/Reception Pathways in Learning documents and how the children have accessed and applied themselves with the designed curriculum. For children who are genuinely working well below, there are additional notes put onto our electronic system which outlines more detail.

From Year 1, we assess via consideration as to how well the children have grasped taught objectives over the lessons. The teachers also do testing with the children once a term (NTS

papers). Year 1 start these papers in the spring term. All of this information is used and the teachers input a professional judgement of whether the children are 'well below', 'working towards', 'expected' or 'greater depth'. Children with SEND needs may sit an out of year group NTS paper.

This information is also used by teachers when reporting to parents.

We know our children are progressing via application of their knowledge in lessons, accuracy in relation to specific objectives, retention from previous years being built upon and recall in a test situations.

We understand cultural capital as '... the essential knowledge that pupils need to be educated citizens, introducing them to the best that has been thought and said, and helping to engender an appreciation of human creativity and achievement.' We understand it as a thread throughout the whole curriculum. In mathematics, we consider it holistically looking at mathematical links – for example, when the children are studying the achievements in the Islamic Golden Age in history; achievements in computer science; when looking at key figures ensuring we don't keep to a stereotype (for example, looking at Ada Lovelace); looking at a range of key people within whole class reading lessons (for example Alan Turing); looking at a range of key people within our selected home readers (for example, Bessie Coleman who was an outstanding mathematics student who became an early American civil aviator and was the first African-American woman and first Native American to hold a pilot license).

Why is it organised like this?

Our curriculum is organised in this way to fully meet national curriculum and Early Years requirements , but to also support the children with an appropriate build up of their knowledge.

We feel it is essential to teach it as a discrete subject to ensure full and accurate coverage, however we feel that by understanding where the meaningful cross-curricular links are, it further deepens the children's knowledge, builds their confidence and shows the relevance of the subject in our lives.

For all of our SEND children (and within our Universal Offer) White Rose is used to ensure access to fluency, problem solving and reasoning at a secure pitch.

For some of our SEND children (SEND support), although our Targeted Learning Models were set up as Catch-Up Models, they have proven to be an effective teaching and learning model which support our less complex SEND children well and have proven impact on their progress. The mixture of highly effective teachers, highly effective and exceptionally well-deployed support staff, well-considered planning with well-considered re-visiting, strong use of manipulatives and visuals and excellent questioning leads to high levels of progress.

For our most complex children (pupils with an EHCP), the targeted support via SEND models, 1:1 support, or small groups allows for the pitch of the learning and the pace of the learning to be fully needs led.

A strong focus on vocabulary is essential for us as a school due to our high levels of EAL and also Speech and Language needs. By recapping on language, introducing new language, not making presumptions and threading vocabulary through our teaching, the children can access the learning more. Target Maths (an example of a supplement for fluency) also provides a useful resource to ensure practising of objectives, supporting retention.

We chose White Rose because we felt the challenge element was appropriate to our children and their ability. We also feel the variation supports our children with a variety of opportunities and also supports them to not feel phased by different presentations. The use of White Rose has transformed maths across our school and significantly raised the level of challenge. For children who need it, we ensure more fluency opportunities are in place. Ahead of our changes to our maths curriculum, our maths was too 'routine' with too heavy a focus on fluency, 'routine' problems, such as stepped word problems and a lack of reasoning.

We feel the mix of fluency, non-routine problem solving and reasoning is important to deepen the children's mathematical understanding and thinking and to allow them to apply their knowledge in a range of ways. As per our school vision, the latter really supports the aspiration and resilience of our children. One of our challenges can be lack of perseverance within strong reasoning and this is something our curriculum continues to address.

We believe that basic skills and fluency are vitally important for accurate and rapid recall and to be able to apply this to a range of question types. We revisit basic skills often to ensure the knowledge truly sticks. Part of our school vision is around independence and we firmly believe that strength in basic mathematical skills supports this.

Linking to prior learning, as with all subject areas, is essential and teachers use progression documents and prior learning sections within White Rose small steps to ensure this is covered and used within their teaching.

Explicit modelling within sessions is an essential way to develop the children's understanding and our children have spoken very positively about where this modelling has happened when they have felt 'stuck'. Worked and partially worked models support our children as does breaking complex material into smaller steps. Teachers also make use of 'think aloud' to model metacognitive processes.

Guided examples also support the children as allows them to work through a question at a slower pace, really considering every element. Children have opportunity to work independently, in pairs and in groups. We do believe there are times children need to be able to work through maths on their own to see what they can do and to see how they apply themselves. We also believe that chances to work in pairs and groups allows for confidence building, learning through discussion and ways to work through errors together.

Effective feedback ensures children are able to consider errors and work on corrections. We have done work as a school on children looking favourably on errors and seeing them as learning opportunities. Timely feedback in class works well, as it allows children to have a go of a few questions, then discussions and checks, allowing them to then continue with further feedback for the session.

Our EYFS is set out in the way it is as we believe the children need to be immersed in number to allow for deepening their understanding. We have found teaching time on the carpet, with effectively planned adult led sessions and interweaved challenges in the environment has over

time shown to support good progress. We also believe that allowing the children to lead their own mathematical thinking deepens their understanding further. The White Rose scheme of work gives many ideas for deepening of learning within the environment.

Following them ceasing during the pandemic, 'Stay and Plays' and 'Stay and Learns' are set to return and these often have links to maths to ensure our parents equally buy in to the need for building positive attitude towards maths at this young age and the importance of needing this strong foundation as they move forward. We also offer a yearly maths workshop to parents to offer ideas and suggestions on how they can support their child to develop their mathematical skills at home.

How are knowledge, understanding and skills developed in this subject?

See maths curriculum mapping.

What does this subject look like…

in lessons?	in books / Seesaw?	in the environment?
Basic skills are covered each week and objectives revisited Use of manipulatives White Rose is followed from Reception upwards More fluency for children who need this. Fluency, problem solving and reasoning is threaded through lessons Feedback is given with chances to amend errors. Chances to work independently, in pairs and in groups. Explicit modeling. Guided questions. Vocabulary focus.	Most days work is recorded in the books. Year 1 will have more on Seesaw due to the practical element. There is not the expectation to take photos of practical work, however this is often done and can be recorded on Seesaw. Children can mark their fluency and some problem solving questions via feedback. Reasoning questions are marked by the teacher. Chances to add to answers and amend errors will be seen.	Each classroom has a maths working wall. There will also be relevant support for learning (for example: number bonds, times tables, 100 squares) There is a school maths display on the corridor, which changes focus (for example, work to be proud of, maths across the curriculum, maths in our jobs etc)

How is this subject resourced? There is a central maths cupboard, which is the responsibility of all staff to keep organised, however the maths team oversee this. There is a list of what resources are kept here. In addition to this, all classrooms have extensive amounts of manipulatives which the children have free access to to support their learning. This looks different in each phase, however all children in each classroom understand how to access manipulatives. We ensure there are appropriate funds in the maths budget to resource and the maths team regularly carry out audits to check what staff need to teach effectively. There is an investment in the staffing for the maths team.		