



## Whitemoor Academy – Maths Curriculum Statement

### Vision:

At Whitemoor, we are aware that every child arrives at school with different experiences and different levels of understanding. However, we envision a curriculum where all of these children (no matter their experiences or understanding) are supported and encouraged to reach their fullest potential. As part of our school vision, we see a classroom where every child is actively engaging with problem solving, reasoning and mathematical discussions. We understand that children need some fundamental maths skills in able to reach a level where they can problem solve. Therefore, we see an environment where children can practice and develop arithmetic skills and times tables, so that they can then feel comfortable to engage in problem solving and reasoning activities. Whilst we are fully aware that some children enter our school below national expectations and often missing key skills (arithmetic and times tables), our ambition is to help these children make accelerated progress through a varied curriculum which provides children with plenty of arithmetic and times table practice whilst having reasoning and problem solving running through the core. Although it can be tempting to view problem solving as an extension/challenge for pupils who are higher attaining, we aim to provide every child with the necessary skills to problem solve, by developing their fundamental maths skills, resilience and problem solving strategies.

*“Probably the most important skill that children learn is how to learn. Too often we give children the answers to remember rather than problems to solve.” – Roger Lewin*

### Intent:

The Whitemoor mathematics curriculum focuses on covering the skills outlined in the National Curriculum and, as a school, we are determined to ensure that every child has the greatest opportunity to leave our school having met age-related expectations and feeling prepared for secondary school and further education. At Whitemoor, we view mathematics as a vital (and exciting) subject, which allows pupils to make connections, formulate ideas and provide solutions to everyday problems. Mathematics is essential in day-to-day life: it is vital in science and the world of engineering, it develops financial literacy and it is a necessary skill in almost every form of employment. Therefore, we strive to ensure that our children receive the highest quality maths curriculum available, so that our children can grow up feeling confident in everyday scenarios and feeling curious about how the world works.

At Whitemoor, we endeavour to ensure that all pupils are confident with the use of mathematical vocabulary, using it to make connections, form an argument, reason mathematically and justify their answers. Additionally, we aim to ensure that all pupils are fluent with the fundamentals of mathematics (through consistent, varied practice, which increases in difficulty over time). As well as developing the children's fundamental knowledge, we aim to develop their problem solving skills through the use routine and non-routine problems, which become more sophisticated over time. We aim to help every child develop the ability to break down problems into a series of steps, work methodically and follow a line of enquiry.

Although the programmes of study in mathematics are organised into distinctive sections, we want our pupils to constantly look for connections/relationships between each mathematical concept, as this will help them develop a deeper understanding, as well as encouraging the use of metacognition (encouraging children to apply learning from their long-term memory). Our ambition is for pupils to see maths as an interconnected subject, where every domain is linked together. By following the White Rose curriculum, we allow children the chance to see how every topic builds on the last, which



we hope will develop the pupils' fluency, reasoning skills and ability to solve increasingly complex problems.

At Whitemoor, we aim for pupils to progress through each mathematical domain at roughly the same pace. However, as we understand that this cannot always happen, decisions about when to move on should be made with the child's depth of understanding at heart. This means that constant consolidation should be happening (through fluency activities, starters or additional practice) to ensure that children are being given every chance to gain an understanding of each domain. Moreover, any children who have grasped the concept should be challenged through the use of rich, detailed problems, as appose to simply moving on to a new content.

At Whitemoor, we strongly value problem solving and reasoning skills, and base this at the core of our values. Therefore, we aim for every lesson to include explicit teaching on how to reason mathematically and how to problem solve. We believe that both skills should be emphasised at the core of each lesson, rather than being used as an extension. This means that every child will experience problem solving and reasoning every day, which we hope will develop their mathematical understanding and will allow them to see more links and patterns across the subject.

To ensure that every child can access the reasoning and problem solving activities and develop these skills, we strive to use concrete, pictorial and abstract representations as much as possible (across all key stages). We hope that this process will allow the children to visualise the problem solving process, seeing it as a series of steps rather than an impossible problem. In addition, we hope that this approach will make every child feel confident that they can achieve in mathematics.

## Implementation

### Foundation Stage:

Every child will engage in a dedicated maths lesson on a daily basis. As well as completing maths lessons, staff will ensure that children are given opportunities to develop their mathematical understanding throughout the day (e.g. by playing games, competing puzzles, creating routines, maths snack time, etc.) Children will also be given the opportunity to have extended discussions, where the use of mathematical vocabulary will be encouraged and scaffolded. Additionally, children will have access to manipulatives to allow them to represent problems in their own way – the choice of manipulatives will be carefully selected by the teacher. Children will also have the chance to present their problems using visual representations (e.g. drawings). The aim is for teachers to allow children time to fully understand a concept in before moving on, as we aim for depth of understanding in EYFS.

### Interventions at EYFS:

Teachers will use a variety of assessment strategies to monitor the understanding of their pupils. By using these strategies, they will be able to plan and deliver specific and appropriate interventions. Interventions can take place in a range of ways (dependent on the needs of the children). One example of an intervention could be in a small group setting, where children are given more focused support to help the develop an understanding of a specific mathematical skill. Another example could be a 1:1 intervention, which would most likely be used if a child is working at a level significantly below and/or if the child has a special educational need.

### Key Stage One:

Children will engage in a maths lesson every day. As well as this, children will have the chance to consolidate their learning throughout the day, by playing games, completing puzzles, solving problems and creating class routines. By using the White Rose curriculum, the children in KS1 will have access to content that is appropriate to their age. Additionally, following the White Rose curriculum will ensure that all the children in KS1 are covering all areas of the National Curriculum. Children will also be given



the opportunity to have extended discussions, where the use of mathematical vocabulary will be encouraged and scaffolded by the teacher. Moreover, children will have access to manipulatives to allow them to represent problems in their own way – the choice of manipulatives will be carefully selected by the teacher. Children will also have the chance to present their problems using visual representations (e.g. drawings).

**Interventions:** When children are identified as not making expected progress, small group interventions/ 1:1 interventions are put in place (depending on the needs of the children). The intervention scheme we apply is 'Number Stacks'. This is a scheme that aims to identify specific barriers to learning/ misconceptions and can be run consistently across the school year. This process begins with a diagnostic test, where pupils answer questions below and up to their age –related expectation (pupils never answer questions from the year above). Following the test, gap analysis can be used to identify gaps in understanding which will form the starting point for the intervention. Pupils then work from their starting point up to their age-related expectation, meaning that pupils should then be comfortable to go back into the classroom and access the learning. Number Stacks has 5 modules (Number and place value, addition and subtraction, multiplication and division, fractions and decimals and percentages). Intervention slots are organised between the teacher and teaching assistant (or outside agency if required) and can be reviewed/altered whenever it is deemed appropriate.

## Year 2 and Key Stage Two:

Every child will engage in mathematics daily. By following the White Rose curriculum, we ensure that the entirety of the curriculum is covered throughout the year. Additionally, following the White Rose curriculum means that children will be exposed to appropriate problems each lesson, allowing them to apply the skills they learnt in the lesson.

We teach maths as whole class lessons (with a 3-teacher model in Year 6), so that every child has access to age-related content. This means that the skills and knowledge that they are gathering are appropriate for their age and level. Throughout the school, we deploy a wide range of strategies (scaffolding, whole-class problems, arithmetic sessions and times table superheroes) to ensure that the children are developing every aspect of their mathematical knowledge, thus deepening their mathematical understanding. As well as these strategies, we aim to implement a concrete, pictorial, abstract model, where children get to work through a process to help them fully understand key concepts.

**Arithmetic:** Arithmetic is practiced in every maths lesson using fluency activities. Teachers use the White Rose Small Steps to find and adapt carefully selected arithmetic activities, which match up with the topic they are covering. Children get the chance to complete independent, paired and whole-class arithmetic practice throughout each lesson to help them develop their arithmetic skills. Teachers also ensure to make links (when appropriate) to show the children that each individual arithmetic skill has a larger purpose in their overall mathematical understanding.

**Times Tables:** Times tables are taught separately by following the Times Table Superheroes scheme. This allows children to track their own progress and it ensures that they are getting consistent practice on times tables that they struggle with. In addition, we also use Times Table Rockstars to encourage children to practice at home. Teachers set specific games, sessions and battles to encourage the children to engage with times tables as much as possible. Times table knowledge is also touched upon in maths lessons (when appropriate) to show children that sound times table knowledge is vital in developing their mathematical fluency and understanding.

**Reasoning and problem solving:** Reasoning and problem solving is part of every maths lesson, as children are given a whole class and individual problem each lesson. Teachers use metacognitive strategies to model good practice and to teach children how to apply their existing knowledge to help them solve problems. Teachers will also use worked examples to act as a stimulus in the classroom, which will show the pupils the appropriate steps in order to efficiently solve a problem. Additionally, teachers will share correct mathematical terminology (combined with stem sentences) to encourage



children to reason mathematically. Children will have the opportunity to reason in every lesson through the use of carefully planned activities.

**Interventions:** In instances where children are not making expected progress, 1:1 and small group interventions will be made available to ensure that these children do not miss out on the chance to fully grasp a mathematical concept. These interventions are made specific to each child/ group of children and will focus on a single mathematical skill. Similar to KS1, we apply the Number Stacks scheme to ensure that learning is specific to each learner. Additionally, in UKS2 there will be a 3 teacher model, where a small group of children get the chance to work in a separate group to boost their confidence. This specific group is focused on low confidence children, not pupils who are low attaining. The group will be completing the same maths lesson as the whole class, but will just have extra support in a smaller group.

**Assessment:** Maths is constantly being assessed every day (through either formative or summative assessments). Children get the opportunity to self-assess at the end of every lesson and our school's 'whole-class marking' policy allows teachers to identify any pupils who struggled in the lesson, which will allow them to adjust their next lesson if necessary. Additionally, the children will complete arithmetic practice tests (weekly in year 6), White Rose end of unit tests (at the end of each topic) and White Rose progress tests (termly in year 3-5) to ensure that their progress is being tracked at regular intervals. In year 6, White Rose progress tests are replaced with past SATs papers. Following assessment, teachers complete GAP analysis to help them identify children who need extra support. It is expected that, through the use of consistent assessment and analysis, children will meet ARE by the end of the year.

#### Love of maths (whole school):

We encourage a love for maths in the following ways:

- We believe that maths understanding is deepened by instilling a curiosity to discover and a love for problem solving in our children. We believe that our curriculum, which centres around finding patterns/links and problem solving, encourages the children to develop these qualities.
- We understand that sound recall of times tables (up to 12x12) can severely boost a child's mathematical ability, as good recall is vital in topics such as fractions, four operations, converting measures and many more. Therefore, we aim to encourage children to develop a love for times tables by introducing Times Table Rockstar competitions/battles.
- To develop a deeper understanding of mathematics, pupils need the time to explore concepts visually and physically. Therefore, we encourage children to 'play' with manipulatives to help them visualise problems. Additionally, we introduce maths games as much as possible (when appropriate) to show the children that maths can be incredibly enjoyable. Some examples of this are: playing battleships to develop knowledge of translation/coordinates, playing bingo to encourage the use of rounding to the nearest 10, 100 and 1000, building towers to help calculate volume and many more.
- Engaging children in the problem solving process (metacognition and whole class problems).
- Relating problems to real life as much as possible.
- Encouraging children to be pattern 'detectives' by always trying to find links between topics/ prior knowledge.

#### Impact:

##### Early Years:

In the Foundation Unit, teachers assess children's learning using the Foundation Stage Profile (FSP). Most of the observations for assessment are based on those activities that children initiate and engage with independently across the range of provision.

By the end of F2 it is our expectation that:



- Children can accurately and reliably count to 20
- Children can place numbers in order (1-20)
- Children can identify a number that is 1 more/ 1 less than a number between 1-20.
- Children can add and subtract two single digit numbers
- Children can solve problems which include doubling, halving and sharing
- Children should recognise + and – symbols, showing an understanding of what they mean
- Children are comfortable to discuss problems with their teacher/peers (using everyday language), including problems which involve size, capacity, position, distance, time and money
- Children will enjoy/ and be comfortable using manipulatives to represent problems/concepts
- Children have made expected progress (i.e. assessed by the teacher using the FSP)
- Teacher's judgements are quality assured by the curriculum leader using first hand evidence – pupil voice, observations, books, phase meeting minutes, planning and teacher interviews.
- Regular phase meetings ensure that maths progress is constantly being monitored and makes sure that staff are making appropriate judgements.
- SLT monitor every class twice each year in Pupil Progress meetings to discuss interventions, identified children and groups, progress, attainment etc
- It is expected that children will be able to access learning that is appropriate to their year group.

## Years 1-6:

- All children will enjoy problem solving, using their skills to make links between topics.
- Children of all levels and backgrounds will be able to achieve in maths, through the use of appropriate scaffolding and metacognitive strategies.
- Children will enjoy completing times table battles and will be willing to complete times table rockstars battles at home.
- Children meet age related expectations (assessed using termly tests) and if they are not meeting ARE, carefully targeted interventions are put in place to support them.
- Children will have developed their arithmetic skills to a level where they can apply them to a range of different problems.
- Children will leave school with the ability to make links between mathematical domains and with a deeper understanding of mathematical concepts.
- By the end of Year 6, the children will have a variety of mathematical skills, which they will be able to apply and develop throughout secondary school.
- Children will be able to draw upon prior learning to help them make sense of new learning.
- All children will be able to achieve in arithmetic and reasoning tests, showing that they are able to apply their knowledge.
- Progress will be assessed regularly using appropriate tests, with the data being used to identify areas of need and potential intervention groups.
- Staff will be efficient in the use of GAP analysis to assess work and select appropriate next steps.
- Whole class marking will ensure that feedback is relevant and given as soon as possible.
- We track children's progress using OTrack assessment tracker. We do this twice a year and this is monitored by the Maths Curriculum Leaders alongside other members of SLT. This records whether children are meeting age related expectations.
- Teacher's judgements are quality assured by the curriculum leader using first hand evidence – pupil voice, observations, books, phase meeting minutes, planning and teacher interviews.
- Regular phase meetings ensure that maths progress is constantly being monitored and makes sure that staff are making appropriate judgements.
- SLT monitor every class twice each year in Pupil Progress meetings to discuss interventions, identified children and groups, progress, attainment etc
- It is expected that children will be able to access learning that is appropriate to their year group.

