Walmsley C of E Primary School

Mathematics Curriculum Statement

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Curriculum Statement Cover Note

Title of the Policy	Mathematics Curriculum Statement
Summary/Reason for bringing to Governing Board for Approval	Review
Statutory Requirement	No
Decisions to be made / recommendation on options	
Name of the author	R Saxby
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Policy/Procedure to be published on the school website	Yes
Amendments/Updates	

Vision

Growing as a family to flourish in God's love.

Guided by God, we will provide rich, memorable learning experiences which will build character in each individual child.

We will ensure that all children are able to flourish and experience God's wonderful world in all its fullness.

Together as a family we aim to love, respect, aspire, trust, show compassion and be resilient.

Resilience *Trust* *Aspiration* *Hope* *Respect* *Love*

Introduction
This policy outlines the teaching, organisation and management of the mathematics taught and learnt at Walmsley CE Primary School. This document is intended for all staff with classroom responsibilities, school governors, parents, inspection teams, LEA advisors and interested others. Copies are provided to school staff and the governing body.

The National Curriculum for Mathematics aims 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.

Principles of Teaching for Mastery

All children are encouraged to believe that by working hard at maths they can all succeed. Pupils are often taught through whole-class interactive teaching, where the focus is on all pupils working together on the same lesson content at the same time. This ensures that all can master concepts before moving to the next part of the curriculum sequence, allowing no pupil to be left behind. Support is available for children who need it, such as through the use of equipment, resources, mathematical models or teacher / teaching assistant intervention. Deeper challenge opportunities are available when and as children need them, such as through reasoning and problem solving, being asked to explain their thinking, or asking to provide alternative methods. There are five key or "Big Ideas": Representations and Structure, Mathematical thinking, Fluency and Facts, Variation, and Coherence. If a pupil fails to grasp a concept or procedure, this is identified quickly and early intervention ensures the pupil is ready to move forward with the whole class.

Teaching time
To provide adequate time for developing mathematical skills each class teacher will provide a daily mathematics lesson. This may vary in length but will usually last for about 45 minutes to 1 hour in Key Stage 1 and 60 minutes in Key Stage 2. Cross-curricular links will also be made to mathematics within other subjects so pupils can develop and apply their mathematical skills.

Reception
2 x 10 min practice number and number bonds
3 x 10 mins NCETM Mastering Number programme

KS1
Daily flashbacks focussing on retrieval

3 x 15 mins NCETM Mastering Number programme
Fluency work around number bonds/ counting and number formation

LKS2
Daily retrieval – flashback
Daily fluency work (tough ten / times tables)

UKS2

Daily retrieval – Pie Corbett 5 a day/Flashback
1 x 30 min arithmetic lesson in addition to daily maths lesson
Daily fluency work. (Tough ten / times tables)

Preparation and Planning
Year 1 to 6 follow White Rose Mathematics Long Term planning and Small Steps planning and they adapt it for the needs of their class. Class teachers record the small steps that they have covered on the Maths Overview planning document. Reflecting the mixed age classes in Y1/2 and Y3/4, the White Rose planning caters for both year groups in each lesson.

The White Rose resources which accompany each Small Step, should be reviewed and adapted where necessary to best suit the needs of their class. Lesson design should ensure that the lesson, or a series of lessons are a carefully sequenced journey through the learning. Planning should identify the key end points for the children to achieve and the key vocabulary/stem sentences to use. In addition, class teachers should consider the resources to be used during the input and the guided practice part of the lesson, and the support and challenge they need to build into their lesson design to enable all children to achieve and be challenged at the appropriate level. A CPA (concrete, visual, abstract) approach is always considered and incorporated into the lesson design.

On the Maths overview planning document, there are 'Rapid Recall Facts' which have been identified for that year group. These are the key facts and mental maths skills which children need to know or be able to use. These will be taught over the year through the White Rose Small Steps and can also be practiced in either the fluency part of the lesson, or outside of the lesson.

Development of fluency and atomicity.

At Walmsley Primary School there is an emphasis on the importance of developing fluency with mathematical facts.

Fluency involves:

- Quick recall of facts and procedures

• The flexibility and fluidity to move between different contexts and representations of mathematics.

• The ability to recognise relationships and make connections in mathematics

Tough Ten

In Y3-Y6, classes will complete a Tough Ten challenge three or more times a week either at the start of the day or at the start of a lesson. Vocabulary Ninja's Whole School Maths Starter System or the 'Tough Ten' offers 10 questions everyday linked to the National Curriculum and mathematical expectations for each year group to help pupils develop confidence in answering fluency-based maths questions that link closely to success in arithmetic and ultimately success in reasoning. It also links in with the rapid recall facts we want children to know in our fluency policy The aim is to complete these at speed and teachers may wish to give a time limit. Many questions require a mental strategy to complete but some questions require a written method which draw on their fluency and recall of number facts e.g. adding digits in column addition. Y1/Y2 has this as a resource but may also choose to do some other work around fluency and counting.

Monitoring System of KS1 Number Facts

There will be a focus on children recalling addition, subtraction and number facts which are monitored across KS1 in the following order:

Addition facts within five	Rabbit level
Subtraction facts within five	Monkey level
Addition facts within ten	Dog level
Subtraction facts within ten	Fox level
Number bonds to 10	Zebra level
Doubles and halves of numbers to 10	Bear level
Addition and subtraction facts within 20	Panda level
Number bonds to 20	Lion level
Doubles and halves of numbers to 20	Giraffe level
Number bonds to 100	Tiger level
Add and Subtract 2 digit numbers to multiples of 10	Elephant level

These number facts are tested in school once a week in KS1. Each test will consist of 20 questions. Children must achieve 17/20 for three consecutive tests to achieve the level. When they achieve each level, they will be presented with a special animal sticker. Children will have a set time to complete the test at the discretion of the class teacher but the aim is for quick recall. This may be modified for SEN children where teachers feel it is needed.

Each week, children are set homework on addition and subtraction facts using Numbots. On the Year 1 and Year 2 class page of our school website, there are some number sense practise sheets should parents wish to use any further resources at home.

<u>Developing Fluency in Multiplication and Division Facts</u>

Children at Walmsley Primary are provided with regular opportunities, both in class and through engaging homework activities, to develop times tables knowledge. This ensures rapid recall of multiplication and division facts.

Fluency in times tables reinforced through use of the very popular Times Tables Rock Stars programme. Children have the opportunity to use this at school and are encouraged to use it at home as times tables practice. The programme is used in classes in a competitive way and the children find the programme fun, engaging and motivating to use.

The learning of times tables begins in Year 2 and in Year 4, children sit the National Multiplication Tables Check (MTC) where they are expected to know their tables from 2s to 12s.

The times tables are taught in the following order:

Year 2 x2 / x5 / x10
Year 3 x3 / x4 / x8
Year 4 x6 / x7 / x9 / x11 / x12
Year 5 Revise all tables / long multiplication
Year 6 Revise all tables / long multiplication

Monitoring of Times Tables

To mirror the order the tables tables are taught, Walmsley have developed the following approach to monitoring recall of times tables.

Times tables will be tested once a week. They will be tested using a 'precision' grid approach.

2s	Recall of x2	2x badge
5s	Recall of x 5	3x badge
10s	Recall of x 10	10x badge
Bronze	recall of x2 / x5 / x10 mixed	bronze badge

3s	Recall of x3	3x badge
4s	Recall of x4	4x badge
8s	Recall of x8	8x badge
Silver	Recall of x3 / x4 / x8 mixed (+ previous)	silver badge

6s	Recall of 6s	6x badge
7s	Recall of 7s	7x badge
9s	Recall of 9s	8x badge
Gold	recall of x6 / x7 / x9 mixed (+ previous)	gold badge

11s	Recall of 11s	11x badge
12s	Recall of 12s	12x badge
Platinum	recall of x11 / x12 (+ previous)	I know all my tables badge

Each precision style test will consist of 50 questions. Children must achieve 45 / 50 for three consecutive tests to achieve the level. When they achieve each level, they will receive a badge. Children will have 5 minutes to complete the test. This allows them just over 5 seconds per question. (Teachers have the discretion to adjust this where necessary for SEN children). They will earn a badge in class for each table they learn. When they achieve their bronze, gold, silver or platinum level, they will receive their badge in assembly from Mrs Atherton.

Each week, children are set homework to practise their times tables using Times Table Rockstars. On the Year 3 and Year 4 class page on our school website parents can some find some additional practise sheets, should they wish to print out any further resources for your child to practise at home.

Text Books and Teacher Resources

White Rose Mathematics have teaching PowerPoints and worksheets which contain a variety of varied fluency, reasoning and problem solving questions which teachers can use with their children. These resources are linked to all of the Small Steps and can be adapted by teachers. Whilst these resources are likely to be used in a significant proportion of lessons, teachers will also use other textbooks and other resources as and when they feel they need to. Y2-Y6 have Target Your Maths along with a variety of other textbooks and teaching resources which supplement the resources. Year 1-4 have Maths No Problem text books that they can refer to. On the school network, there are a number of other resources that staff can use to develop their teaching and learning: Ready to progress powerpoints, NCETM Mastery materials and the 2020 DFE guidance.

Core visual representations are used across the school to allow children to develop their understanding through a pictorial approach to maths and are a key component of the White Rose resources.

Recording of Children's Work

Children in Year 1-6 record their work in a maths book. These should be a place where children can record their thinking, explanations, methods and reasoning in any format they feel is suitable. They can also record their answers to more formal questions set by their teacher. Children in reception and Y1 will complete less work in their books than other year groups, due to the very practical nature of their learning at this age. They may choose to work with concrete resources and whiteboards more often than other year groups and this work can be evidenced through on of a number of ways: planning, photographs, work in books from a later lesson, pupil voice.

Expectations for work in books are that the work is neat and working out is structured and presented clearly. Children should record one digit per box and rulers should be used for underling. Techers should consider which reasoning/ problem solving/challenge questions done in the guided practice or the independent work need to be prepared so they can stuck in books. Whole worksheets stuck in should be kept to a minimum. Any worksheets which need to be used should be neatly cut down and not folded over. Children in Y2-Y6 should be doing the majority of their work in their maths books. Rec and Y1 will have more worksheets to stick in, but will still need practise of recording themselves in their books.

Teaching and Learning

In a typical lesson pupils sit facing the teacher and the teacher leads back and forth interaction, including questioning, guided practice, explanation, demonstration, and discussion. Procedural fluency and conceptual understanding are developed in tandem because each supports the development of the other. Significant time is spent developing deep knowledge of the key ideas that are needed to underpin future learning. The structure and connections within the mathematics are emphasised, so that pupils develop deep learning that can be sustained.

During most lessons, children will spend a proportion of the lesson working independently, and during this time, focus can be given to those children who need intervention by the teacher, and/or live marking can take place.

Effective questioning is a key part of a maths lesson. Rosenshine's research (2012) shows that effective teachers ask more questions from more students in greater depth; they check for understanding, involve all learners, explore thinking processes and misconceptions, and interrogate correct answers. This is how teachers uncover misconceptions and challenge pupils to deepen understanding.

Questioning takes many forms. See appendix 1 for the strategies that we promote.

Fluency style questions may also be practiced within, or outside a lesson, such as key multiplication tables and addition facts within 10. This is to encourage automaticity to avoid cognitive overload in the working memory and enable pupils to focus on new concepts. (See our fluency policy for more detail).

A typical lesson structure looks like this:

- Fluency starter/ counting / game / retrieval practice – linked to skills needed in lesson.
- Teaching input
  Hook / reasoning problem to solve*. Stem sentences/key vocabulary and concrete and pictorial materials would be used here to expose the structures of the mathematics being taught.

- Guided Practice
  Including fluency, reasoning and problem solving. The teacher uses questioning to assess understanding – who is secure and who needs further development?

- Independent practice – varied fluency, reasoning and problem solving
  Support / scaffold those children who need it
  Challenges available to those who need them
  Live marking and checks/feedback where appropriate

- Marking/ address errors / addressing misconceptions/consolidation
  - *reasoning / problem to solve may appear at a different point in the lesson.

Building on Prior Learning through Retrieval

Children are also given the opportunity to revisit and build upon prior learning regularly over the week, in addition to their daily maths lesson. This is through the use of White Rose Flashback 4 resources in Y1-Y5, and Pie Corbett's 5 a day resources in Y6. These are to be used daily throughout school.

Current homework books also give children the opportunity for consolidation and to revisit previous learning.

Marking and Feedback

Marking and evidence-recording strategies should be efficient, so that they do not steal time that would be better spent on lesson design and preparation. Neither should they result in an excessive workload for teachers. There must be a balance between light touch, in depth and live marking especially where a child has misunderstood a concept.

Teachers should mark in line with the School's Marking and Feedback Policy. They should use highlighters to reflect whether a learning objective has been met or partially met:

Met their Learning Objective - The left margin at the top of the work must be highlighted with a green dash

Partially met their Learning Objective – This must be highlighted in orange. Child/group of children have received support to enable the child/ group to meet the objective of the lesson.

It is important for teachers to distinguish between a pupil's simple slip and an error that reflects a lack of understanding. Slips should be corrected/addressed where appropriate, errors can be addressed through the daily intervention, lesson plenary, individual or small group work or picked up in the next lesson.

Pupils benefit from marking their own work. Part of this responsibility is to identify for themselves the facts, strategies and concepts they know well and those which they find harder and need to continue to work on. Teachers should check over any work that has been marked by the children.

Equipment

To allow for a Concrete, Pictorial, Abstract approach to Mathematics, each class is resourced with a large amount of equipment, such as Base 10, place value counters, tens frames, number lines, fractions etc. Maths equipment can be found in classrooms readily available for children as and when they need it. In Y1-Y4, classes have baskets with appropriate equipment for the unit of work which can be placed on desks to allow children to readily access what they need.

Knowledge Organisers
For each unit of work, a Knowledge Organiser should be stuck in the children's book so that they can refer to these during their lessons. The knowledge organisers should contain key vocabulary and visual representations and images to support the children's learning and understanding. All Knowledge Organisers will be placed on the school website and will be available for parents so that they are aware of the key concepts being taught, and can be used at home to support homework. Parents will be shown them during the Meet the Teacher meeting in September each year. In reception, key visuals will be displayed in the classroom and on the website, rather than in books.

Homework
Homework is set weekly in mathematics, in both Key Stages. This usually consists of a page from a CGP Arithmetic book in KS2. In KS1, their homework books are from White Rose and link closely to the work completed in class. Timestable Rockstars are also set from Y3-Y6 (and in the summer term, Year 2). KS1 will be set Numbots.

Parent-School Links
Parents are invited to a Meet the Teacher evening during September, when they are invited to come and meet their child's new class teacher, and are provided with information about the curriculum in that Year group, key objectives and age- related expectations where the maths curriculum and the approach we take is discussed. There is also a parents evening early in the Spring term, when parents can find out about the progress their children are making, targets for further learning, and ways in which they can help with this at home. In July a written report is sent home with detail about progress and performance in mathematics, and parents are invited into school to look at their child's books.

Parents are invited in for a Maths Parent Workshop once a year to look at methods used in school and understand the culture of Maths at Walmsley. This workshop will be run by the Maths Lead.

Links between mathematics and other subjects/ daily life.
Mathematics contributes towards many subjects within the primary curriculum and where possible opportunities will be sought to draw mathematical experience out of a wide range of activities. This will allow children to begin to use and apply mathematics in real contexts. In lessons, we will also use everyday contexts to frame some of the concepts we are discussing with the children so that they can relate to the use of math in daily life.

How we cater for children with special educational needs
All pupils are included in the daily mathematics lessons and have experience of direct, interactive and lively teaching appropriate for their age and stage of development. Teachers use a variety of teaching styles in order to cater for the various learning styles of children e.g. using music to enhance learning times-tables.
During the interaction with the teacher, a mixture of questions will be directed at the whole class and some questions pitched specifically at particular groups or individuals within the class, in order to ensure the involvement of all pupils. SEND pupils will aim to stay within

the daily maths lesson working on the same concept as their peer but with appropriate scaffolding and support, such as TA support, concrete equipment, working at a lower level within that concept.

However a pupil whose difficulties are severe or complex may need to be supported with an individualised programme in the main part of the lesson, and may work outside the classroom for part of the lesson.

How we work in the Early Years

The reception class is organised to promote social skills and the development of mathematical language and understanding. Teaching is based on the Early Learning Goals (Number and Number Pattern) and is assessed by using the Foundation Stage Profile. This will prepare the children for starting the National Curriculum in Year 1.

Usually the organisation will be planned as follows;
Fluency starter/ counting / game / retrieval practice – link to skills needed in lesson.

Teaching input to the whole class on the main topic for the day. Stem sentences/key vocabulary and concrete and pictorial materials would be used here to expose the structures of the mathematics being taught.

Guided Practice with groups on a rota (x 3 groups)
Including fluency, reasoning and problem solving. Questioning will be used to assess understanding and to check who is secure and who needs further development. Support / challenge will be built in where necessary.

Two groups will be completing an independent activity
Continuous provision will be provided offering opportunity for consolidation of learning

Marking and addressing errors will take place in the moment during the lesson. A plenary with the whole class after the group activities have ended, to consolidate, address misconceptions and extend learning through discussion and questioning what they have been learning and to praise progress.

The Reception class teachers use White Rose Long Term planning and Small Steps to plan and sequence their lessons. They use resources from here, but also supplement these with resources from Master the Curriculum which are closely aligned with White Rose.

Mastering Number Programme

In addition to the daily maths lesson, Reception and KS1 deliver the NCETM Mastering Number Programme to their classes. This project aims to secure firm foundations in the development of good number sense and fluency for all children. The aim over time is that children will leave KS1 with fluency in calculation and a confidence and flexibility with number. Reception have 3 sessions of 10 minutes a week, and Y1-Y2 have three sessions of 15 minutes a week.

Working Walls

All teaching classrooms should have a Maths Working Wall which reflects what the class are currently working on that week. It should display current key vocabulary/relevant stem sentences, and concrete / pictorial representations/abstract methods where appropriate. There should be evidence of challenge/deeper thinking questions which children can refer to and use when explaining their thinking (e.g. I've noticed that…, I know this because…) or when developing their reasoning skills (e.g. Convince me..., True or false, Always Sometimes Never). Each classroom should also display a 'Number of the Day' which reflects the key 'Rapid Recall Facts' that children need to know. These can be used at the start of a lesson, when children are waiting for other children to finish a question, or outside of the maths lesson to develop the children's mental maths skills.
Sticky knowledge from previous lessons/units should be displayed in the classroom as and when needed.

Assessment
Assessment will take place at three connected levels: short-term, medium-term and long-term. These assessments will be used to inform teaching in a continuous cycle of planning, teaching and assessment.
Short-term assessments will be an informal part of every lesson to check their understanding and give teachers information, which will help teachers to adjust day-to-day lesson plans and identify children who need intervention. Key questions will be used to measure the children's success.

Medium-term assessments or review lessons will take place in each half term or at the end of a unit of work, as appropriate, and will assess some of the key objectives that have been covered. This is decided by the class teacher.

More formal assessments take place on October and June where Y1-5* sit Smart Grade arithmetic and reasoning papers. The results of these tests are kept on our tracking system and are scrutinised throughout the year to identify children who may need additional support or challenging further, and to monitor progress and attainment over the year compared to previous years. Teachers will also draw upon their knowledge of the performance of their class against key learning indicators of performance and supplementary notes to produce a summative record. This information will then be reported to parents and the child's next teacher.
Children in Year 6 complete several SAT past paper tests leading up to their SATs in May as well as weekly arithmetic assessments. All results of these 'mock' assessments are analysed to identify the progress and attainment of children, and they help identify children in need of extra support, such as support lessons/ 1:1 /small group work outside of the daily maths lesson.

APPENDIX 1 Questioning Strategies

➢ Cold Call: This is a 'no hands up', dialogic approach that keeps all pupils engaged. This makes feedback meaningful so that teaching is responsive to pupils' needs and levels of understanding.

➢ No Opt-Out: This allows teachers to return to pupils who get an answer wrong so they can show their understanding. It can also be used to engage pupils who refuse to answer to help establish a culture of academic learning and rigour.

➢ Think, Pair, Share: This allows all pupils to engage in a structured discussion that provides an opportunity to think generatively, share ideas and rehearse answers.

➢ Whole-Class Response: This allows the teacher to access responses from each pupil in order to get an overview of class understanding.

➢ Check for Understanding: This dialogic approach seeks to uncover the extent of understanding from a range of pupils to determine whether to explore, re-teach, defer, or move on.

➢ Say It Again, Better: This allows teachers to set academic expectations for verbal responses and pupils to develop greater levels of success by adding depth, accuracy or sophistication to initial answers. It can also be used to develop grammar.

➢ Probing: By asking multiple, linked questions to a few pupils, teachers can promote deep thinking and allow pupils to make connections.

➢ Process Questions: By seeking out the 'how and 'why', teachers can develop pupils' metacognition, deepen their understanding and help them to evaluate their responses.

➢ Hinge Questions: These are key questions that allow the teacher to know whether a teaching point needs to be developed or the class is ready to move on. Questioning strategies are often used in combination e.g. 'Probing' may be followed by a wider 'Check for Understanding'; 'Think Pair Share' by 'Cold Call' and 'Probing'