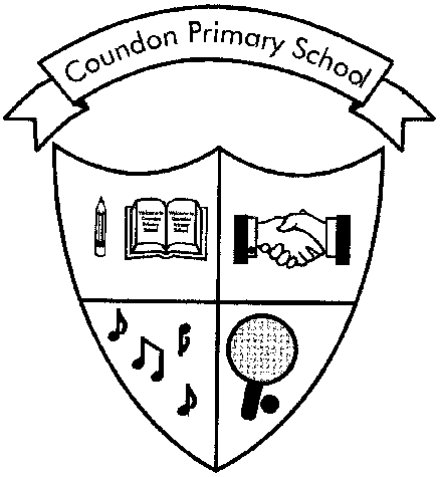
COUNDON PRIMARY SCHOOL
POLICY BOOKLET



MATHEMATICS
September 2024

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Date of approval	
Signed by Chair of Governors	
Signed by Headteacher	
Review Date	September 2026 or before if required

MATHEMATICS POLICY

Introduction

This policy describes our values and philosophy in relation to meeting the needs of all mathematical learners at Coundon Primary School. It outlines the framework within which all staff work and gives guidance on planning, teaching and assessment. It is designed to describe how the school intends to meet the needs of mathematics learners of all ages.

In the first instance this will be through working within the Foundation Stage Curriculum using the Early Learning Goals. From Y1 to Y6 statutory requirements of the National Curriculum in Mathematics will be met by fully implementing the New National Curriculum objectives through the use of the White Rose Maths planning documents.

The policy is intended to be read in conjunction with the calculation policy which illustrates strategies and methods outlined in the National Curriculum and that are taught from Reception to year 6.

Rationale

What is Mathematics?

Mathematics is a creative and highly inter-connected discipline that has been developed over centuries, providing the solution to some of history's most intriguing problems. It is essential to everyday life, critical to science, technology and engineering, and necessary for financial literacy and most forms of employment. A high-quality mathematics education therefore provides a foundation for understanding the world, the ability to reason mathematically, an appreciation of the beauty and power of mathematics, and a sense of enjoyment and curiosity about the subject. (National Curriculum 2014)

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

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

Develop positive attitudes to mathematics, recognising that mathematics can be both useful and enjoyable. Be able to use and apply their mathematical skills in other curricular areas.

The National Curriculum sets out year-by-year programmes of study for key stages 1 and 2. This ensures continuity and progression in the teaching of mathematics.

The EYFS Statutory Framework 2021 sets standards for the learning, development and care of children from birth to five years old and supports an integrated approach to early learning. This is supported by the 'Development matters' non statutory guidance. The EYFS Framework in relation to mathematics aims for our pupils to:

- Develop a strong grounding in number so that all children develop the necessary building blocks to excel in mathematically.
- Count to 10, including have a deep understanding on these numbers, the relationships between then and the patterns within those numbers.
- Have frequent and varied opportunities to build and apply their understanding.
- Calculate simple addition and subtraction problems
- Develop their spatial reasoning skills across all areas including shape, space and measures.

- Develop positive attitudes and interest in maths, be willing 'to have ago' and not be afraid to make mistakes.
- Look for patterns and relationship and make connections.
- Talk to adults and peers about maths

Aims

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

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 will always be based on the security of pupils' understanding and their readiness to progress to the next stage. Pupils who grasp concepts rapidly will be challenged through being offered rich and sophisticated problems to develop mastery before any acceleration through new content. Those who are not sufficiently fluent with earlier material will consolidate their understanding, including additional practice, before moving on.

The purpose of mathematics in our school is:-

- To develop a fascination and enjoyment of mathematics as a subject, in which all children can achieve and be successful.
- To develop positive attitudes towards mathematics, recognising that mathematics can be both useful and enjoyable.
- To equip children with the mathematics they need to become numerate and confident in using and applying mathematical knowledge, concepts and skills.
- To develop their ability to apply mathematical skills with confidence and understanding when solving problems.
- To help children understand the importance of mathematics in everyday life.
- To develop an ability to solve problems, to reason, to think logically and to work systematically and accurately.
- To enable children to express themselves and their ideas, using the language of mathematics both orally and in written form.
- To develop initiative and motivation to work both independently and in cooperation with others.
- To become confident in the communication of maths where pupils ask and answer questions, openly share work and learn from mistakes
- To be able to use and apply the skills of mathematics in other curricular areas.

Breadth of study

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

- practical activities and games using a variety of resources
- individual, paired, group and whole class learning and discussions
- purposeful practise to embed and apply concepts
- open and closed tasks
- problem solving and reasoning to challenge thinking
- overlearning activities to practise and embed skills over time
- making appropriate choices from a range of calculation methods – mental and written
- working with computers as a mathematical tool
- opportunities to extend and apply knowledge built into curriculum themes

Teaching and learning of Mathematics

Teachers plan for deep coverage and mastery of the curriculum through daily lessons and additional opportunities to develop mental maths skills.

The Mastery Approach

In September 2023, Coundon Primary School began transitioning towards a mastery approach to the teaching and learning of mathematics. We understood that this would be a gradual process and take several years to embed. The rationale behind changing our approach to teaching mathematics lay within the NCETM Maths Hub Programme as well as the 2014 National Curriculum, which states:

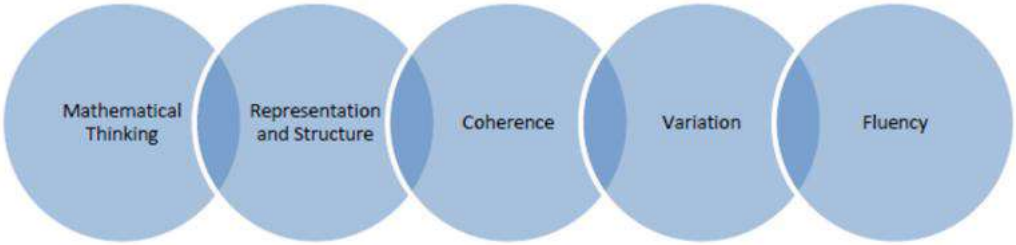
• The expectation is that most pupils will move through the programmes of study at broadly the same pace.
• Pupils who grasp concepts rapidly should be challenged through being offered rich and sophisticated problems before any acceleration through new content.
• Those who are not sufficiently fluent with earlier material should consolidate their understanding, including through additional practice, before moving on.

What is Mastery?

Children are deemed to have 'mastered' a particular objective when they are able to build on it to develop understanding of new mathematics. For each objective, children must have enough conceptual and procedural fluency to enable them to solve non-routine problems in unfamiliar contexts without relying on memorised procedures.

The '5 Big Ideas'

Our teaching of mathematics using the mastery approach is underpinned by the NCETM's 5 big ideas.



Long term planning

The National Curriculum for Mathematics 2014, Development Matters and the Early Learning Goals (Number, Shape Space & Measure) provide the long term planning for mathematics taught in the school.

Medium term planning

We follow the EYFS curriculum guidance for Mathematics. In Nursery, the objectives from the White Rose scheme of learning are used to support the teaching of the curriculum objectives. In Reception, Mastering Number forms the basis of the curriculum supported by the small steps and objectives from the White Rose scheme of work.

Years 1,2,3, 4 and 5 use the White Rose Maths schemes of learning as their medium term planning documents. Years 6 follow the objectives from the National Curriculum for Mathematics 2014, and will use appropriate elements from the White Rose Maths schemes of learning. In addition, the DfE Ready to Progress guidance 2020 are used to support planning in identifying core mathematical concepts from the National Curriculum and the progression from years 1 to 6. It sets out the most important knowledge and understanding within each year group and the important connections between these mathematical topics.

These schemes provide teachers with exemplification for maths objectives (small steps) and are broken down into fluency, reasoning and problem solving (notes and guidance), key aims of the National Curriculum. This ensure teachers stay in the required key stage and support the ideal of depth before breadth. This ensures pupils are working at an appropriate level and provides plenty of time to build in reasoning and problem solving elements into the curriculum.

Short term planning
The above schemes of learning support daily lesson planning. EYFS planning is based on the medium term plans and delivered as appropriate to individual children with thought to where the children are now and what steps they need to take next.

Teachers plan for deep coverage and mastery of the mathematics curriculum through daily lessons and additional opportunities to develop mental maths skills. Plans for daily maths lessons include teaching, practicing, apply and reviewing; catering for all learning styles. Differentiation is used within class to allow access to the curriculum for all learners.

Lessons include opportunities for:
• Practical activities and mathematical games
• Problem solving
• Individual, small group and whole class discussion's
• Mathematical reasoning problems
• Use of ICT
• Outdoor learning

Teachers use a wide range of support material to inform planning, these include:
• White Rose maths
• TTRockstars
• Numbots
• Maths Hub – Teaching for Mastery

Organisation

- All classes in Key Stage 1 and 2, have a daily mathematics lesson, where possible, of 45-60 minutes in length, with all lessons including elements of fluency, problem solving and reasoning.
- Children are taught within year groups. All children are taught through a whole class setting, with appropriate support, differentiation and challenge provided.
- Teachers of EYFS ensure the children learn through a mixture of adult led activities and child initiated activities both inside and outside of the classroom. Mathematics is taught through an integrated approach.
- In Nursery, one planned mathematics session is taught each week, with daily sessions on basic mathematical skills.
- In Reception, five planned mathematics sessions are taught per week. During the first term, children are taught whole class and then complete an individual or teacher-led activity. In addition, the children receive a weekly maths challenge.
- In Year 1, there is a daily whole class teacher-led maths session. Following this two small groups led by an adult, apply their mathematical understanding to a task. The other children then access continuous provision, where there are opportunities to access maths activities related to previous learning.

Teaching Strategies and approaches
In all lessons, learning key skills are displayed and discussed. The emphasis in lessons is to make teaching interactive and lively, to engage all children encouraging them to talk about mathematics.

Lessons involve elements of:

- Instruction – giving information and structuring it well;
- Demonstrating – showing, describing and modelling mathematics using appropriate resources and visual displays;
- CPA – providing a balance of concrete, pictorial and abstract experiences appropriate to the learning;
- Explaining and illustrating – giving accurate and well-paced explanations;
- Questioning and discussing;
- Reasoning and problem solving -including the use of sentence stems;

- Consolidating – providing purposeful practise, overlearning and application opportunities;
- Reflecting and evaluating responses – identifying mistakes and using them as positive teaching points;
- Summarising – reviewing mathematics that has been taught enabling children to focus on next steps

All Years 1-6 follow the same lesson design;
Recap – Recap previous learning, this can be from a skill that will support this lesson, or from another, term, unit etc.
Discover – (Teacher led, paired work, practical work)
Thinking Together – Teacher led (I do, we do, you do) Practical.
Independent Practice – Complete independent work applying the mathematics and skills learnt.
This moves through fluency, conceptual and procedural variation, to reasoning and problem solving.
Reflect – Opportunity for children to show what they have learnt.

To provide the children with active and stimulating learning experiences, a variety of teaching and learning opportunities are adopted. The core of any new learning is conceptual understanding. Concrete resources are used to reinforce understanding before moving onto pictorial representations. Finally, when conceptual understanding is secure, more abstract problems are introduced. The mastery curriculum is achieved through the use of varied teaching strategies combined with the application of problems to new contexts. The fundamental idea is to provide the children with a broad base of knowledge followed by deeper conceptual understanding.
In addition;

- Children may work individually on a task, in pairs or in a small group, depending on the nature of the activity.
- Wherever possible practical 'real life' activities are used to introduce concept and reinforce key skills.
- Opportunities to transfer skills learnt to real situations are used wherever possible.
- Activities are planned to encourage the full and active participation of all children.
- Teachers differentiate tasks throughout the lesson in order to the meet the needs of all abilities. In most year groups this is achieved through the use of layered learning (Clouds, Moons and Stars). Through this approach children are encouraged to select their own level of learning. They are then able to progress onto the next layer when ready within the lesson. Further challenges are provided for those that need it. At times, teachers may direct children towards a particular layer to ensure the appropriate skills are being taught by the child.
- Teachers place a strong emphasis on correct use of mathematical language. This is supported by key vocabulary being displayed.
- Teachers value children's oral contributions and create an ethos in which all children feel they can contribute.
- A 'routeway' through calculation has been agreed. The mental and written methods of calculation taught are exemplified in the 'Routeway through calculation' documentation.
- IT is used where appropriate by teachers and children to support the teaching and learning of mathematics.

The approach to the teaching of mathematics within the school is based on four principles;

- A mathematics lesson taught everyday
- A clear focus on encouraging children to explain their thinking and develop reasoning for answers and decisions.
- An emphasis on mental calculation, particularly knowledge of multiplication and division facts
- Regular opportunities to use and apply the mathematics which they have learnt, both within maths lessons and across the curriculum.

Mastering Number
From September 2024, Coundon Primary will begin to train and implement the Mastering Number programme in Reception, Year 1 and year 2. The aims to secure firm foundations in the development of good number sense for all children from Reception through to Year 1 and Year 2. Over time, children will leave KS1 with fluency in

calculation and a confidence and flexibility with number. Attention will be given to key knowledge and understanding needed in Reception classes, and progression through KS1 to support success in the future.

Maths sessions

In addition to the daily maths session, there is a daily PAL – **Practice And Learn** maths skills session of between 15 and 20 minutes. Practice And Learn, provides bespoke overlearning of key skills through fun, engaging and interactive activities including ICT.

Principals of PAL maths sessions include:

- Daily practice and over-learn sessions of between 15 to 20 minutes outside of daily maths lesson
- Repetition, Revisiting, Reinforcement
- Targeting of basic skills
- Three-part session: counting, number facts, overlearning – including calculations
- Consistent images and terminology
- Weekly Friday assessments – PAL facts and PAL Challenge
- Linked to home learning maths target system
- Common planning format
- Common assessment tracking system

Organisation of PAL sessions:

- Teachers class teach all children working at 'expected', at 'depth' or working 'one term behind'
- Supplementary teaching groups focusing on target, underachieving or SEN children are led by additional teachers, HLTAs or TAS across KS1 and KS2

Pupils' Records of work

Children are taught a variety of methods for recording their work and are encouraged and helped to use the most appropriate and convenient. Children are encouraged to use mental strategies and their own jottings before resorting to more formal written methods. Children's own jottings to support their work is encouraged throughout all year groups.

Mathematics and cross curricular links to other subjects

Children's learning and progress in many subjects often depends on what they know and understand and can do in mathematics. At the same time, these subjects provide a rich source of stimulus and motivation for pupils to improve their mathematics skills. Learning is enhanced in both subjects.

Children learn mathematics skills best at the point when they are needed, in meaningful, relevant contexts. Alongside specific skills, such as counting and calculating, more general skills in mathematical thinking are important.

Mathematics and English

Mathematics actively promotes the skills of reading, writing, speaking and listening. For example we encourage children to read and interpret problems in order to identify the mathematics involved. Younger children enjoy stories and rhymes that rely on counting and sequencing. Older children encounter mathematical language, graphs and charts when using non-fiction texts.

Mathematics and Computing

Computing enhances the teaching of mathematics significantly, because computing is particularly useful for mathematical tasks. It also offers ways of impacting on learning which are not possible with conventional methods. Teachers can use software and the interactive whiteboard, to present information visually, dynamically and interactively, so that children understand concepts more quickly. All children also have access to mathematics games and activities at home via Numbots and Times Tables Rockstars. Calculators should not be used as a substitute for good written and mental arithmetic. They should therefore only be introduced near

the end of key stage 2 to support pupils' conceptual understanding and exploration of more complex number problems, if written and mental arithmetic are secure.

Mathematics and Design and Technology
D & T provides opportunities for children to apply their mathematics skills to real life situations e.g. accurate measuring to create a product or the costing of materials. D & T allows the children to use their skills and understanding of time, measurement, shape and space.

Mathematics and Art
Mathematics has a long historical relationship with Art. Children are able to use a range of media to create art work applying their understanding of shape, symmetry, translation and tessellation as well as ratio e.g. mixing paint.

Mathematics and Humanities
Both History and Geography give children the opportunity to further develop and apply their understanding of Mathematics. For example in History, children are able to look at historical data in tables and graphs, look at the history of mathematics and how it developed e.g. The Ancient Greeks, as well as order dates on a time line. In Geography, children are able to read maps, tables and graphs, using measuring equipment to collect rain water etc.

Mathematics and Science
Scientific investigations provide a wealth of opportunities for children to use their mathematical skills in context, including measuring and collecting data, making estimations and approximations, drawing tables and graphs, interpreting results and drawing conclusions.

Mathematics and Personal, Health, Social Education and Citizenship
The work that children do outside of their normal lessons encourages independent study and helps them to become increasingly more responsible for their own work. The planned activity within the classroom encourages them to work together and respect each other's views. We present children with real-life situations in their problem solving and money work.

Special educational needs and disabilities (SEND)
At our school, our daily maths lessons are inclusive to pupils with special educational needs and disabilities. Mathematics forms part of the school curriculum policy to provide a broad and balanced education to all. Through our mathematics teaching, we provide learning opportunities that enable all children to make good progress. Where required, children's IEPs incorporate suitable objectives from the National Curriculum for Mathematics or development Matters and teachers keep these in mind when planning work. These targets may be worked upon within the lesson as well as on a 1:1 basis outside the mathematics lesson. Maths focused intervention in school helps children with gaps in their learning and mathematical understanding. These are delivered by trained support staff and overseen by the SENCO and/or the class teacher. Within the daily mathematics lesson teachers have a responsibility to not only provide differentiated activities to support children with SEND but also activities that provide sufficient challenge for children who are high achievers. It is the teachers' responsibility to ensure that all children are challenged at a level appropriate to their ability.

Equal opportunities
Positive attitudes towards mathematics are encouraged, so that all children, regardless of race, gender, ability or special needs, including those for whom English is a second language, develop an enjoyment and confidence with mathematics.
The aim is to ensure that everyone makes progress and gains positively from lessons as a result of inclusive lesson planning. Lessons involving lots of visual, aural and kinaesthetic elements will benefit all children including those for whom English is an additional language (EAL).

Assessment

Assessment is an integral part of teaching and learning and is a continuous process. Assessment is used to inform teaching and learning. Children's understanding is assessed and future planning is used to address misconceptions and provide opportunities to extend and challenge the learners further .

Teachers make assessments of children through:

- regular marking of work (see Marking Policy)
- analysing errors and picking up on misconceptions
- asking questions and listening to answers
- facilitating and listening to discussions
- making observations
- AFL strategies – including starter/plenary questions and exit tickets
- PAL maths – PAL facts and PAL Challenge weekly assessments
- cumulative curriculum records
- multiplication and division facts tracker

These ongoing assessments inform future planning and teaching. Lessons are adapted readily and short term planning evaluated in light of these assessments.

Medium term

Termly assessments are carried out across the school in the autumn, spring and summer terms using standardised assessment materials. In addition, White Rose end of unit assessments are carried out after each block of teaching.

These materials used alongside judgements made from class work support teachers in making a judgement for each child, which, in line with the assessment policy, they enter onto Target Tracker.

Pupil Progress meetings are timetabled each term for all classes. Progress of pupils is discussed and appropriate intervention considered and put in place where appropriate.

Long term

Y6 complete the national tests (SATs) and Year 4 complete the Multiplication Test check.

Guidance on feedback marking (see school Marking Policy)

Feedback should enable children to:

- reflect on their success
- understand the areas they need to work on
- develop their skills further

It should:

- be focussed towards the learning intention/key skill
- address misconceptions
- develop children's understanding and mathematical skills
- provide next steps at least twice per week
- praise success as a result of effort, perseverance and resilience – including the use of stickers

Children should be given time to respond to comments and marking in the maths lesson or during the school day.

Intervention programmes

Interventions based on assessment knowledge and statutory expectations is used to plan for the learning needs of identified children and ensure rapid gains towards working at the expected standards are made.

TAs and HLTAs deliver maths intervention programmes such as PUMA Shine and Hands on Maths, providing targeted intervention pre and post teaching to identified children ensuring access to next steps in learning through quality first teaching.

Staffing and resources

Development of mathematical knowledge is encouraged, with external courses being sourced where necessary, or internal inset being provided by the mathematics standards leader.

Resources for mathematics are updated annually, according to need. Those resources used daily are easily accessible in every classroom; those not used regularly are stored centrally and are easily accessible by all staff.

Environment

It is important that the classroom environment supports both the learning and teaching of mathematics. The school aims to provide a mathematically stimulating environment:

- through the development and use of working walls to support learning and teaching in a lesson or series of lessons including key vocabulary, sentences stems and models and images.
- through interactive displays that promote mathematical thinking and discussion.
- through displays of child's work that celebrate achievement
- by providing a good range of resources for teacher and child use.

Presentation

High standards of presentation through the modelling of consistent expectations, combines with positive reinforcement ensure children take pride in their work.

Expectations in KS1 and KS2 include;

- squared exercise books – numbers and symbols in separate squares
- short date – top left hand corner of the page and underlined, e.g. 03/05/12 → then leave a line
- key skill underlined with a ruler eg. KS: To multiply TO x O

  Note: For younger children in KS1 or less able children in KS2 these can be printed and stuck in books
- Number formation based on Nelson Handwriting scheme
- Rulers used at all times

Homework

We recognise the importance of making links between home and school and encourage parental involvement with the learning of mathematics.

Homework provides opportunities for children

- to practise and consolidate their skills and knowledge,
- to develop and extend their techniques and strategies,
- to share their mathematical work with their family
- to prepare for their future learning

Monitoring and Evaluation

The coordination and planning of the mathematics curriculum is the responsibility of the standards leader, who also:

- supports colleagues in their teaching, by keeping them informed about current developments in mathematics and any by providing a strategic lead and direction for the subject;
- gives the head teacher updates alongside the assessment leader, in which s/he evaluates the strengths and weaknesses in mathematics, and indicates areas for further improvement.
- lead by example in the way they plan, teach and assess in their own classroom
- prepare, organise and lead INSET, with support of the head teacher prepare and use effectively the budget for mathematics
- monitor and observe colleagues teaching and planning, when appropriate, with a view to identifying strengths and areas for support
- attend relevant INSET review and update the policy every 2 to 3 years.

Policy updated September 2023

Victoria Walton (Mathematics standards leader)