

Maths Policy:

Contents



1. Curriculum statement
2. Teaching and learning
3. Assessment
4. Planning and resources
5. Recording and presentation
6. Organisation
7. Equality, inclusion and special needs
8. EYFS
9. Home-school links
10. Presentation
11. Monitoring and Review

1. Curriculum Statement

Intent

The 2014 National Curriculum for Maths aims to ensure that all children:

- *Become fluent in the fundamentals of Mathematics.*
- *Are able to reason mathematically.*
- *Can solve problems by applying their Mathematics.*

Our aim at Kniveton Primary is for all children to enjoy mathematics and have a secure and deep understanding of fundamental mathematical concepts and procedures when they leave us to go to secondary school. We want children to see the mathematics that surrounds them every day and enjoy developing vital life skills in this subject.

Aims for our pupils:

- To develop a growth mindset and positive attitude towards Mathematics.
- To become confident and proficient with number, including fluency with mental calculation, and to look for connections between numbers.
- To become problem solvers who can reason, think logically, work systematically and apply their knowledge of mathematics.
- To develop their use of mathematical language.
- To become independent learners and to work co-operatively with others.
- To appreciate real life contexts to learning in mathematics.

At Kniveton, these skills are embedded within Maths lessons and developed consistently over time. We are committed to ensuring that children are able to recognise the importance of Maths in the wider world and that they are also able to use their mathematical skills and knowledge confidently in their lives in a range of different contexts.

At Kniveton Primary School, we use a teaching for mastery approach. Teaching for mastery supports the idea that everyone can do maths- all pupils are encouraged by the belief that by working hard at maths they can succeed. We want all children to enjoy Mathematics and to experience success- we firmly believe that all children can achieve high standards in Mathematics.

Implementation

In September 2018, Kniveton 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.*

The content and principles underpinning the 2014 Mathematics curriculum and the Maths curriculum at Kniveton reflect those found in high-performing education systems internationally. These principles and features characterise this mastery approach and convey how our curriculum is implemented:

- Teachers reinforce an expectation that all children are capable of achieving high standards in Mathematics.
 - The large majority of children progress through the curriculum content at the same pace; significant time is spent developing deep knowledge of the key ideas that are needed to underpin future learning. This ensures that all can master concepts before moving to the next part of the curriculum sequence.
 - 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.
 - The structure and connections within the mathematics are emphasised, so that pupils develop deep learning that can be sustained.
 - Lesson design identifies the new mathematics that is to be taught, the key points, the difficult points and a carefully sequenced journey through the learning. In a typical lesson pupils sit facing the teacher and the teacher leads back and forth interaction, including questioning, short tasks, explanation, demonstration and discussion.
 - Practice and consolidation play a central role. Carefully designed variation within this builds fluency and understanding of underlying mathematical concepts.
 - Teachers use precise questioning in class to test conceptual and procedural knowledge and assess children regularly to identify those requiring intervention, so that all children keep up.
 - Children's explanations and their proficiency in articulating mathematical reasoning, with the precise use of mathematical vocabulary, are supported through the use of stem sentences provided by the teacher. Children are always encouraged to answer questions in full sentences.

- Key facts, such as multiplication tables and addition facts within 10, are learnt to automaticity to avoid cognitive overload in the working memory and enable pupils to focus on new concepts.

[The Essence of Mathematics Teaching for Mastery | NCETM](#)

To ensure whole school consistency and progression, the school uses the nationally recognised White Rose Maths scheme. The White Rose curriculum is a cumulative curriculum, so that once a topic is covered, it is met many times again in other contexts. The curriculum is designed to have an emphasis on number, with a large proportion of time spent reinforcing number to build competency.

Lessons are planned to provide plenty of opportunities to build reasoning and problem-solving elements into the curriculum. When introduced to a new concept, children have the opportunity to use concrete objects and manipulatives to help them understand what they are doing. Alongside this, children are encouraged to use pictorial representations. These representations can then be used to help reason and solve problems. Both concrete and pictorial representations support children's understanding of abstract methods.

Mathematical topics are taught in blocks, to enable the achievement of 'mastery' over time. These teaching blocks are broken down into smaller steps, to help children understand concepts better. This approach means that children do not cover too many concepts at once which can lead to cognitive overload. Each lesson phase provides the means for children to achieve greater depth, with children who are quick to grasp new content, being offered rich and sophisticated problems, within the lesson as appropriate.

Impact

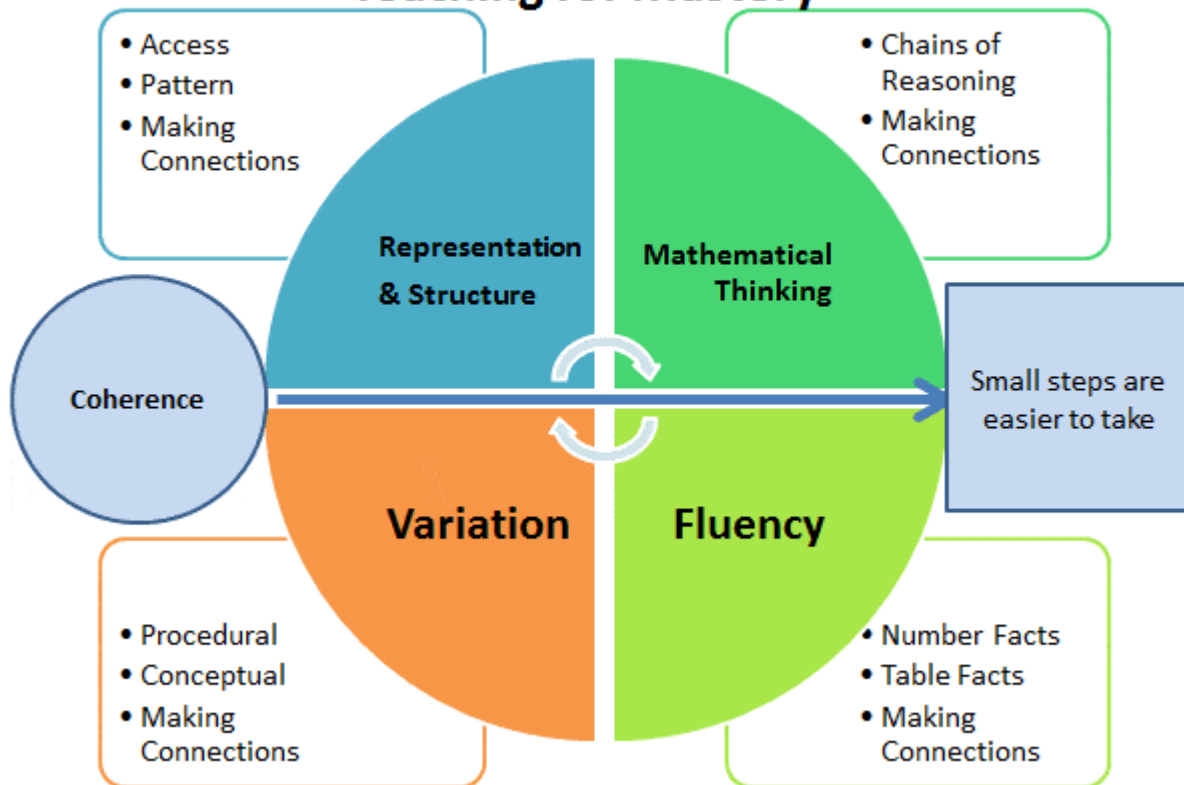
The school has a supportive ethos and our approaches support the children in developing their collaborative and independent skills, as well as empathy and the need to recognise the achievement of others. Students can underperform in Mathematics because they think they cannot do it or are not naturally good at it; Kniveton School's use of White Rose Maths addresses these preconceptions by ensuring that all children experience challenge and success in Mathematics.

Regular and ongoing assessment informs teaching, as well as intervention, to support and enable the success of each child. These factors ensure that we are able to maintain high standards, with achievement at the end of KS2 in the top 1% nationally (2022) as well as an increasingly high proportion of children demonstrating greater depth at the end of each phase.

2. Teaching and Learning

Effective teaching for mastery is underpinned by five big ideas, first published by the National Centre for Excellence (NCETM) in Mathematics in 2017:

Teaching for Mastery



- Opportunities for mathematical thinking allow children to make chains of reasoning connected with the other areas of their mathematics.
- A focus on representation and structure ensures concepts are explored using concrete, pictorial and abstract representations; the children actively look for patterns and generalise whilst problem solving.
- Coherence is achieved through the planning of small, connected steps to link every question and lesson within a topic.
- Teachers use both procedural and conceptual variation within their lessons and there remains an emphasis on Fluency with a relentless focus on number and times table facts.

Source: [Five Big Ideas in Teaching for Mastery | NCETM](#)

Lesson Structure

- Lessons are sharply focused.
- Key new learning points are identified explicitly.
- There is regular interchange between concrete/contextual ideas, pictorial representations and their abstract/symbolic representation.
- Mathematical generalisations are emphasised as they emerge from underlying mathematics, which is thoroughly explored within contexts that make sense to pupils.
- Making comparisons is an important feature of developing deep knowledge. The questions “What’s the same, what’s different?” are often used to draw attention to essential features of concepts.

- Repetition of key ideas (for example, in the form of whole class or group recitation, repeating to talk partners etc) is used frequently. This helps to verbalise and embed mathematical ideas and provides pupils with a shared language to think about and communicate mathematics.
- Teacher-led discussion is interspersed with short tasks involving pupil to pupil discussion and completion of short activities.
- Formative assessment is carried out throughout the lesson; the teacher regularly checks pupils' knowledge and understanding and adjusts the lesson accordingly.
 - Gaps in pupils' knowledge and understanding are identified early by in-class questioning. They are addressed rapidly through individual or small group intervention, either on the same day or the next day, which may be separate from the main mathematics lesson, to ensure all pupils are ready for the next lesson.
- Teachers discuss their mathematics teaching regularly with colleagues, sharing teaching ideas and classroom experiences and working together to improve their practice. The subject leader's role as SLE (teaching PGCE students and providing support to other schools) also enhances practice within school and aids subject knowledge development amongst staff.

3. Assessment

The assessment of mathematics is part of the overall assessment of the complete child and should be seen alongside all the other areas of development. Assessment in mathematics should reflect the general principles and procedures laid down in the Assessment Policy. Assessment in mathematics is continuous and ongoing- there are assessment opportunities in every lesson. Teachers look for children who know the why and how as well as those who demonstrate procedural fluency through the quick, accurate and efficient calculation of correct answers. Teachers also look for children who are able to apply their understanding of mathematics flexibly in new and unfamiliar situations. These on-going assessments that teachers make as part of every lesson and through marking, help teachers to adjust their teaching on a day-to-day basis.

a. Assessment for Learning:

Children receive effective feedback through teacher assessment, both orally and through written feedback, and AfL is integral to the design of each lesson:

- Daily fluency activities support children's recall of key number facts, which frees working memory. Teachers will make informed choices as to when they should progress to new content according to the degree of fluency that children are able to demonstrate.
- Common misconceptions are identified and addressed within the teaching sequence and key understanding within each 'small step' is reviewed and checked by the teacher and the children before progression to further depth.
- At the end of the lesson, the children review their work and self and peer assessment are often used as outlined by the school's marking policy.
- Opportunities for additional practice and correction are provided by the teacher, as appropriate, during marking, with a focus on promoting and achieving a growth mindset approach in the subject.

b. Formative Assessment:

Short term assessment is a feature of each lesson. Observations and careful questioning enable teachers to adjust lessons and brief other adults in the room if necessary- the structure of a White Rose Maths lesson is designed to support this process.

At the end of each blocked unit of work, teachers ensure that any identified gaps in understanding can be addressed before the next unit is taught.

c. Summative Assessment:

In addition to the formative assessment undertaken in lessons, teachers use termly summative assessments to inform the whole school tracking of attainment and progress of each child.

Teachers use the following assessments:

Year 1 - NTS tests

Year 2 - KS1 SATs papers (from September 2023 this will change to NTS tests in autumn and spring followed by optional SATs tests in the summer.)

Years 3, 4 and 5 - NTS tests

Year 6 - KS2 SATs papers

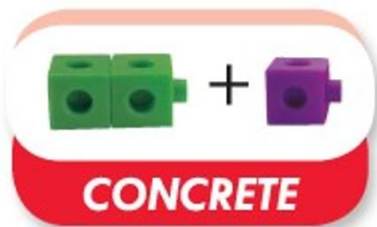
Throughout the year EYFS children are continually assessed against the EYFS Development Matters statements and at the end of the year, they are assessed against the Early Learning Goals for Mathematics. Progress throughout the year is recorded in the form of photographs and observations on an online learning journal called Tapestry.

The recorded data from these assessments are used to track pupil progress and are discussed by the class teacher and the head teacher during termly Pupil Progress Reviews. These meetings assist class teachers and the Maths Leader to make adaptations to planning (and where required, to plan specific interventions) to ensure the needs of all children are met.

Assessment data in maths is reviewed termly to inform interventions and to also ensure that provision remains well-informed to enable optimum progress and achievement. End of year data is used to measure the extent to which attainment gaps for individuals and identified groups of learners are being closed. This data is used to inform whole school and subject development priorities for the next school year.

4. Planning and Resources

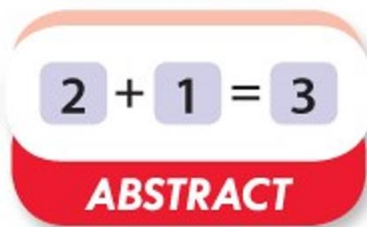
The use of manipulatives is an integral part of the White Rose Maths scheme which incorporates the concrete – pictorial – abstract pedagogy:



Concrete is the 'doing' stage, using concrete objects to solve problems. It brings concepts to life by allowing children to handle physical objects themselves.



Pictorial is the 'seeing' stage, using representations of the objects involved in maths problems. This stage encourages children to make a mental connection between the physical object and abstract levels of understanding, by drawing or looking at pictures, circles, diagrams or models which represent the objects in the problem.



Abstract is the 'symbolic' stage, where children are able to use abstract symbols to model and solve maths problems.

Class 1 and the main classroom are well-resourced with their own supply of mathematical equipment, in line with the White Rose calculation policies, which the school has adopted (this is also available on the school's website):

[PowerPoint Presentation \(whiterosemaths.com\)](http://whiterosemaths.com)

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Teachers also have access to the White Rose Maths Interactive Teaching Resources for the purpose of modelling strategies and demonstrating the use of concrete resources. The school subscribes to the White Rose Maths Premium Resource Centre. This provides access to visual resources (including lesson slides that teachers can adapt), as well as small steps planning guidance and reasoning and problem-solving questions that accompany each small step, to inform and use in lessons.

Teachers are encouraged to use the school playground and field as an outdoor classroom when possible, for example, when teaching length, area or perimeter.

5. Recording and presentation

Please see the Maths Presentation policy for further details.

6. Organisation

The school has implemented a blocked curriculum approach to the teaching of Mathematics, following the White Rose schemes of learning. This ensures that children are able to focus for longer on each specific area of Maths and develop a more secure understanding over time. This approach is also designed to enable children to progress to a greater depth of understanding. Subsequent blocks continue to consolidate previous learning so that the children continually practise key skills and are able to recognise how different aspects of Maths are linked.

7. Equality, Inclusion and Special Needs

Kniveton School aims to meet the needs of all, taking into account gender, ethnicity, culture, religion, language, disability, age and social circumstances. The provision for children with special needs is detailed in the SEND Policy. SEN pupils may be supported by additional adults, different resources or differentiated activities. They may also complete additional activities outside of the mathematics lesson or be taught in a smaller group. We have high expectations of

all children and strongly believe that all children can achieve in mathematics. Some may take longer to grasp concepts and may need careful scaffolding, extra time or support.

8. Early Years Foundation Stage (EYFS)

Children in EYFS explore mathematical concepts through active exploration and their everyday play-based learning. Children are taught key concepts and develop number sense using a hands-on practical approach. The EYFS practitioners provide opportunities for children to manipulate a variety of objects which supports their understanding of quantity and number. Pupils explore the 'story' of numbers to twenty and the development of models and images for numbers as a solid foundation for further progress. The CPA approach (concrete – pictorial – abstract) is used when teaching children key mathematical skills. Practitioners allow children time for exploration and the use of concrete objects helps to support children's mathematical understanding. Mathematics in the early years provides children with a solid foundation that will enable them to develop skills as they progress through their schooling and ensures children are ready for the National Curriculum.

9. Home-school links

We recognise that parents and carers have a valuable role to play in supporting their child's mathematical learning. An overview of the curriculum for each year group is available on the school's website, as well as guidance on end-of-year expectations and the calculation methods used across the school.

Pupils are provided with regular Maths home learning which may involve consolidating learning or practising key number facts like times tables or number bonds.

Parents and carers are informed of their child's progress at two parents evenings and in the annual end of year report. Parents and carers are encouraged to speak to their child's teacher at any point during the year should they have any concerns or questions regarding their child's progress in mathematics.

10. Presentation

Maths Presentation Policy

Aims

- To establish high expectations and pride in everything we do – both of ourselves and of the children.
- To create a clear and consistent set of guidelines for the presentation of children's learning in Mathematics.

Objectives

- To motivate each individual to present their work in the best possible way.
- To enable children to recognise work that is presented to a high standard.
- To ensure each child knows the standard of presentation that is expected of them.
- To create consistency in standards of presentation across the school.

Expectations for Teaching Staff

We are the most important role model for presentation and high expectations. We should use resources available (e.g. on the white board) to model good practice.

- All handwriting on display for the children should be joined, legible and consistently formed. Numerals should also be formed correctly. The date and learning objective should be underlined with a ruler.
- All children's work should be marked using the agreed marking and feedback policy.
- Children's self-assessment and editing should be written in purple pen in key stage 2.
- When it is necessary to stick work/labels/headings in books, ensure they are straight and neatly cut to size.
- Doodling on the cover of books or on work is not acceptable.

Expectations for children

- Pencils should be used in all Maths books.
- Up to the start of summer term of year 2, the learning objective and date will be word processed and stuck into children's books in key stage one. After this time, year 2 will write their own date and LO to prepare them for key stage two.
- At the start of a new piece of work, miss a line under the last piece of work, rule off and write the date in roman numerals on the left-hand side of the page.
- Leave out a line and then write the learning objective for that lesson. This should be written as LO followed by a colon. The first word after the colon should have a capital letter e.g. LO: Prime numbers
- The date and LO should be underlined neatly, on the line, with a ruler.
- Leave out a line after the LO before starting work.
- All numerals should be formed correctly, clearly and rest on the line; there should only be one digit per square.
- Each calculation should be clearly numbered.
- If errors are made, draw one neat line through the mistake with a ruler and start again – do not over-write.
- There should be at least one clear square between each calculation, both horizontally and vertically.
- When solving word problems, the actual calculation should be written. The answer should be written in a sentence where it clarifies a complex problem or where the focus is on maths vocabulary. Attention can be drawn to spelling errors of key words eg by writing LCWCh x5
- When using a vertical layout for formal methods, a ruler should be used for the answer with the operation sign to the left in a separate column.
- Calculations involving decimals should see the point written in the centre of the square between the squares used for the ones and tenths digits.
- Calculations which involve exchanging should see the relevant digit written beneath the bottom line.
- Equations which involve decomposition should see the digit remaining after exchange being written in the top left hand corner where the original digit appeared. This should be smaller than usual.

11. Monitoring and Review

The monitoring and evaluation of the Maths policy is the responsibility of the Maths Subject Leader who is responsible to the Head teacher and the Governors for the development of Maths throughout the school.

Role of the Subject Leader:

- Ensures teachers understand the requirements of the National Curriculum and supports them to plan lessons. Leads by example by setting high standards in their own teaching.
- Leads continuing professional development; facilitates joint professional development; provides coaching and feedback for teachers to improve pupil learning.
- Leads the whole-school monitoring and evaluation of teaching and learning in mathematics by observing teaching and learning in mathematics regularly; analyses assessment data in order to plan whole school improvement in mathematics; conducts work scrutiny to inform evaluation of progress; conducts pupil interviews.
- Takes responsibility for managing own professional development by participating in external training, independent private study, engaging in educational research and scholarly reading and keeping up-to-date with Teaching for Mastery developments.
- Keeps parents informed about mathematics issues.
- Ensures that the head teacher and governors are kept informed about the quality of teaching and learning in mathematics.
- Works in close partnership with the head teacher to ensure the learning needs of all pupils in mathematics are met effectively.
- Keeps the school's policy for mathematics under regular review.