Mathematics Policy

Bishop Pursglove CE Primary School

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1. Curriculum Statement

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

Aims

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.
- 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

At Bishop Pursglove, and in line with the expectations of the National Curriculum, we expect that the majority of pupils will move through the Maths Curriculum at broadly the same pace. We do this through Quality First Teaching and by early identification and intervention for pupils who require additional support to succeed. We also identify those children who flourish in Maths, and offer additional challenges and opportunities to deepen their understanding of the subject. We aim to provide the children with a broad and varied experience of maths, ensuring strong links throughout the taught curriculum and seamless progression through the year groups.

- In the EYFS, children's achievements are on-going and are assessed against the Early Learning Goals.
- Teachers in KS1 and KS2 will make judgements about the children's mathematical attainment in relation to age related expectations as set out in the National Curriculum.
- Assessment for Learning is well established throughout the school and the use of questioning, observation and marking will continue to be key parts of formative assessment as well as termly summative testing which helps inform teacher assessments.
- Statutory assessments take place at the end of Year 2 and Year 6.

To enable greater long-term flexibility within the School's class structure and ensure consistency in knowledge, understanding and progression throughout the whole-school, the school uses the DfE approved 'White Rose Primary Maths Mixed-Age Scheme.' This is fully aligned with the White Rose Maths Hub scheme. New concepts can be shared within the context of an initial related problem(s), which children are able to discuss in pairs or small groups. These initial problem-solving activities enable the discussion and reasoning of mathematical concepts across the whole class.

In KS1, these problems are often presented with objects (concrete manipulatives) for children to use. Children often use manipulatives in KS2 too and are actively encouraged to do this. Teachers use careful questions to draw out children's discussions and their reasoning. The class teacher then leads children through strategies for solving the problem, including those already discussed. Independent work provides the means for all children to develop their fluency further, before progressing to more complex related problems.

Mathematical topics are taught in blocks, to enable the achievement of 'mastery' over time. Each lesson phase provides the means to achieve greater depth, with more able children being offered rich and sophisticated problems, as well as exploratory, investigative tasks, 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 are unable to do it. The White Rose Maths programme addresses these preconceptions by ensuring that all children experience challenge and success in Mathematics by developing a growth mind set. Regular and ongoing assessment informs teaching, as well as intervention, to support and enable the success of each child.

2. Teaching and Learning

A typical lesson using the White Rose Maths Scheme lasts approximately 1 hour. Children begin with a short 'fluency' activity, which supports recall of different mathematical concepts and number facts. Following this, the main lesson begins with an investigative task in which a contextual problem is shared for the children to discuss in partners. This helps to promote discussion and ensures that mathematical ideas are introduced in a logical way to support conceptual understanding.

In KS1, these problems are presented with objects (concrete manipulatives) for children to use. Children may also use manipulatives in KS2. Teachers and Support Staff use careful questions to draw out children's discussions and their reasoning. The children are able to learn from misconceptions through whole class reasoning. Following this, the children are presented with similar carefully adapted problems, which they might discuss with a partner or within a small group. At this point, the level of scaffolding maybe reduced to prepare children for independent practice. This is the 'Have a Go' part of the lesson and the children might record some of their working out in their blue Maths books or on a mini whiteboard. The teacher uses this part of the lesson to address any initial errors and confirm the different methods and strategies that can be used. The children are then shown a 'challenge' which promotes a greater depth of thinking. The class then progress to the 'Practice' part of the lesson which is designed to be completed independently. However, the Teacher may identify pupils from the 'Have a Go' tasks that require additional support and target appropriate intervention immediately. The 'Practice' session uses conceptual and procedural variation to build fluency and develop greater understanding of underlying mathematical concepts. Teachers can apply further adaptations and 'challenge' questions that encourage children to take their understanding to a greater level of depth. These further adaptations may also include a final 'reflect' task. This is an opportunity for children to review, reason and reflect on their learning and enables the Teacher and Support Staff to gauge their depth of understanding.

3. Assessment

3.1 Assessment for Learning:

- Children receive effective feedback through teacher assessment, both orally and through written feedback in line with the learning intention.
- Success Criteria are shared with the children prior to independent work. The process based success criteria in Maths is linked directly to skills and knowledge required to complete the 'Have a Go' part of the lesson and the independent practice tasks.
- At the end of the lesson, the children review their work using a traffic light system which they mark on their practice book as a means to identifying target areas and areas of weakness.
- The teacher also uses the traffic light system to assess independent work. This is then recorded on the daily maths assessment feedback sheet that is used to identify children in need of intervention. More details can be found in the Marking and Feedback Policy.

3.2 Formative Assessment:

- Short-term 'Reflect' assessments are part of each lesson.
- Observations and careful questioning enable teachers to adjust lessons and brief other adults in the class if necessary.
- The lesson structure of the White Rose Mixed Age Scheme is designed to support this process and the opportunity reflect task at the end of the each lesson also allows misconceptions to be addressed.
- At the end of each blocked unit of work, the children complete a short End of Unit Assessment. This consists of varied questions and an opportunity to demonstrate greater depth. Marking and verbal feedback ensure that gaps in understanding can be addressed before the next unit is taught.

3.3 Summative Assessment:

Teachers administer a termly assessment paper (PUMA) designed as part of the White Rose Scheme of Work. Pupils in Year 6 also complete previous KS2 SATS Papers in the Spring Term. These standardised test papers identify children's ongoing target areas. Results are communicated to parents and carers at Parents Evening. They contribute to inform the whole school tracking of attainment and progress for each child.

4. Planning and Resources

The use of Mathematics resources is integral to the concrete – pictorial – abstract approach and thus planned into teaching and learning. The school has a wide variety of good quality equipment and resources, both tangible and ICT based, to support our learning and teaching. These resources are used to:

- Demonstrate or model an idea, an operation or method of calculation.

Resources for this purpose would include: a number line; place value cards; dienes; money or coins; measuring equipment for capacity, mass and length; bead strings; the interactive whiteboards and related software; 3D shapes and/or nets; Numicon and related resources and software; multilink cubes; clocks; protractors; calculators; dice; number and fractions' fans; individual whiteboards and pens; and 2D shapes and pattern blocks, amongst other things.

- Enable children to use a calculation strategy or method independently, by using any of the above or other resources as required

Standard resources, such as number lines, multi-link cubes, dienes, hundred squares and counters are located within individual classrooms.

Resources within individual classes are accessible to all children who are be encouraged to be responsible for their use. Further resources (often-larger items shared by the whole school) are located in the Mathematics Cupboard.

An interactive teaching tool for modelling strategies is available to all teachers as part of the White Rose Maths Scheme. Resources and Guidance to support teachers' own professional development and understanding of new approaches as part of a mastery approach are available on the White Rose Maths online platform. As well as overviews of learning, these include short videos, which demonstrate new methods to ensure accuracy.

Teachers are also encouraged to use the school grounds as an outdoor classroom when possible e.g. when teaching length, area or perimeter.

5. Organisation

By adopting the White Rose Maths Scheme, the school has implemented a blocked curriculum approach to the teaching of Mathematics. 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. For example, in Year 4, when children have completed a block which has enabled them to master the multiplication of two digit numbers, a subsequent block on area and shape might provide opportunities to use this understanding when calculating the area of shapes with 2 digit length and width dimensions.

6. EYFS

In EYFS, we use White Rose Maths for the majority of the time. We also use Development Matters for extra ideas to ensure we are covering key maths skills in a range of ways.

We follow the long-term plan for White Rose Maths throughout the year. At the end of each half term we may have a week left over for assessment purposes or to practise key skills using ideas from Development Matters e.g. counting forwards and backwards, singing counting songs, playing simple maths games and more practical maths activities. Maths is taught five days a week in EYFS.

We use the White Rose lesson format during Maths lessons, which usually consist of a starting stimulus on the screen, followed by questions and reasoning and practical activities (one to one or in small groups.) Every lesson has a clear learning focus. Teachers record in their Marking and Feedback Folder how children have done during the lesson and who may need further support. If the children struggle with the lesson, it will be adapted until children are confident to move on.

In the continuous provision, there is a Maths area inside and out which children can access throughout the day. The Maths provision in the area is changed every half term and the table top Maths provision is changed weekly to reflect what the children learnt the week before or during the current week.

At the end of EYFS, our job is to make sure children leave EYFS prepared for their further journey in Mathematics through school into Year 1 and beyond. If they do not, we need to put 'catch up' in place to make sure that children continue to make progress and 'catch up' with their peers. Where there is a SEND, we follow the Code of Practice and put things in place for individual children making adjustments for their needs.

The Statutory framework for the EYFS (March 2021) states for Mathematics that:

Developing a strong grounding in number is essential so that all children develop the necessary building blocks to excel mathematically. Children should be able to count confidently, develop a deep understanding of the numbers to 10, the relationships between them and the patterns within those numbers. By providing frequent and varied opportunities to build and apply this understanding - such as using manipulatives, including small pebbles and tens frames for organising counting - children will develop a secure base of knowledge and vocabulary from which mastery of mathematics is built. In addition, it is important that the curriculum includes rich opportunities for children to develop their spatial reasoning skills across all areas of mathematics including shape, space and measures. It is important that children develop positive attitudes and interests in mathematics, look for patterns and relationships, spot connections, 'have a go', talk to adults and peers about what they notice and not be afraid to make mistakes.

At the end of the EYFS we hope that children will have met the Early Learning Goals in Mathematics:

<u>Number</u>

Children at the expected level of development will:

- Have a deep understanding of number to 10, including the composition of each number.
- Subitise (recognise quantities without counting) up to 5.
- Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 (including subtraction facts) and some number bonds to 10, including double facts.

<u>Numerical Patterns</u>

Children at the expected level of development will:

- Verbally count beyond 20, recognising the pattern of the counting system.
- Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity.
- Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally.

7. Key Stage 1 and Key Stage 2

As acknowledged by the National Centre for Excellence in the Teaching of Mathematics (NCETM) and the Maths Hub programme – 'The use of well-designed and tested textbooks is critical for the successful implementation of teaching for mastery. A good textbook is both an aid for the teacher in planning lessons and for the children during lessons and working on their own.'

Through Years 1 to 6, we use a coherent programme of high-quality materials and exercises, which are structured with great care to build deep conceptual knowledge alongside developing procedural fluency. Our KS1 and KS2 teachers use workbooks from the DfE approved White Rose Maths series. This scheme is based on the principles of how Mathematics is taught in many high performing jurisdictions in East Asia and aligned with the 2014 National Curriculum.

The White Rose Maths workbooks are arranged in chapters and, over the course of the academic year, all units of the National Curriculum are covered.

In KS1, the initial teaching may take place on the carpet, with the teacher referring to the online platform tools. Children work in small groups for the 'Have a Go' task, or to practise using concrete resources prior to independent task time which takes place on tables.

In KS2, children can also refer to the Workbook, whilst the teacher explains using the online version, during the main teaching activity (1 between 2), as has proven successful in Singapore and Shanghai. The interactive versions used by the teacher to share the contextual questions and visual models which support children's understanding, before the children progress to independent work in each lesson phase.

8. Equal Opportunities

At Bishop Pursglove, we are committed to ensuring the active participation and progress of all children in their learning.

All children will be given equal opportunities to achieve their best possible standard, whatever their current attainment and irrespective of gender, ethnic, social or cultural background, home language or any other aspect that could affect their participation or the progress of which they are capable.

9. Inclusion

Taking a mastery approach, differentiation occurs in the support and intervention provided to different children, not in the topics taught, particularly at earlier stages. The National Curriculum states: 'Children 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.'

There is little differentiation in the content taught but the questioning and scaffolding individual children receive in class as they work through problems will differ, with more able pupils challenged through more demanding problems, which deepen their knowledge of the same content before acceleration onto new content. Children's difficulties and misconceptions are identified through immediate formative assessment and addressed with rapid intervention – commonly through individual or small group support later the same day, where possible.

A range of inclusion strategies are embedded in practice and Teachers are aware of the special educational needs of the children in their Maths class, as well as those who have English as an additional language. Although the expectation is that the majority of children will move through the programmes of study at broadly the same pace, the 2014 National Curriculum states: 'Decisions about when to progress should always be based on the security of children's understanding and their readiness to progress to the next stage.' If a child's needs are best met by following an alternative plan, including coverage of the content from a previous year, this will be overseen by the SENCo, in collaboration with the class teacher with the knowledge of the Senior Leadership Team and other external stakeholders where necessary. Specific arrangements for the provision of children with SEND will be communicated to parents and carers during SEND reviews.

10. The Role of the Maths Subject Leader

- To raise the profile of Mathematics at Bishop Pursglove Primary School through best practice.
- Ensure that all staff have access to professional development including observations of outstanding practice in the subject.
- Model lessons, as appropriate to new staff, NQTs and peers to support continued professional development.
- Ensure the high quality of Maths displays around the school, promote achievement in Mathematics during weekly celebration assemblies and involve the school in 'celebrations' of Maths, including participation in events such as 'World Maths Day'.
- Support staff in providing opportunities for learning outside the classroom in Maths and will identify and organise opportunities which enable this, as appropriate.
- Monitor progression and continuity of Maths throughout the school through learning walks and regular monitoring of outcomes of work in Maths books through work scrutinies.
- Ensure that all staff have access to year group teaching guides and the relevant resources.
- Work alongside the SENCo and other school leaders to monitor children's progress through the analysis of whole school data. This data can then be used to detail how standards in the subject are to be maintained and developed further in the Subject Action Plan.
- Audit and purchase central and class based Maths resources.
- Keep up to date on current developments in Maths education and disseminate information to colleagues through membership of the South Yorkshire Maths Hub (SYMH) and DDAT network meetings.
- Extend relationships and make contacts beyond the school in order to develop the subject.
- Develop opportunities for parents/carers to become more involved in Maths education e.g. Parent Workshops.

11. Parents

We recognise that parents and carers have a valuable role to play in supporting their child's mathematical learning. An overview of the Maths curriculum is available on the school's website, as well as guidance in the progression in calculation methods used by the school.

Parents are informed of their child's progress at Parents Evenings and in the annual End of Year Report.

Parents and carers are encouraged to speak to their child's teacher about Maths at any point during the year, either informally or by making a specific appointment. Information about their child's standards, achievements and future targets in Maths is shared during parent/carer meetings, as well as ways that parents/carers may be able to assist with their child's learning.

Bishop Pursglove Primary school also provides a number of opportunities for parents/carers to learn about what their child is learning and the way their child is being taught through workshops especially designed for parents.

12. Additional Information

Our Calculation Policy provides further detail on how we teach for progression across the school and aims to provide guidance on teaching methodology used throughout the school. Further information on how we help children progress on a day to day basis can be found in our Marking and Feedback Policy.

Finally, it is important for children to use correct mathematical vocabulary and have an understanding of what these terms mean. We have a vocabulary list for years 1 – 6 that breaks down expected vocabulary into year groups and below is a link to an online dictionary which provides definitions and interactive resources which aid understanding of these terms.

http://www.amathsdicitonaryforkids.com/

http://mathsisfun.com/definitions

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