



## **MATHEMATICS POLICY**

**Start: September 2017**

**Review: July 2020**

*Mathematics is a creative and highly inter-connected discipline ... 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)

### **INTRODUCTION**

At St Bartholomew's, we believe that mathematics equips children with a uniquely powerful set of tools for everyday life. These tools include logical reasoning, problem-solving skills and an ability to think in abstract ways.

This policy is underpinned by the school's core values:

**Believe ~ Achieve ~ Respect ~ Trust ~ Succeed**

We aim to secure high standards in mathematics across the school. We aim to develop in our children:

- an understanding of the nature and purpose of mathematics in everyday life
- a positive, resilient attitude towards mathematics
- fluency in mathematical knowledge and concepts
- an ability to solve problems, to reason, to think logically and to work systematically
- an understanding of mathematics through a process of enquiry and experimentation
- initiative and an ability to work both independently and in cooperation with others
- an ability to communicate mathematics in both verbal and written forms, using key vocabulary accurately
- an ability to use and apply mathematics across the curriculum and in 'real life' contexts

### **TEACHING AND LEARNING**

The teaching of mathematics provides opportunities for whole class teaching, group work, paired work and individual work. Through careful planning and preparation, we aim to ensure that throughout the school children are given equal opportunities for:



- developing a core set of mental strategies
- consolidating basic skills and number facts
- developing a range of informal and formal written methods of calculation
- sharing ideas and reasoning about answers, through discussions based on higher order thinking (using BARTs Taxonomy)
- applying mathematical knowledge through practical puzzles and challenges
- developing and applying a strong knowledge of mathematical vocabulary (in both verbal and written forms)
- learning at a greater depth/mastery level

At St Bartholomew's, we recognise the importance of establishing a secure foundation in mental calculation and the recall of number facts before standard written methods are introduced. We use accurate mathematical vocabulary in our teaching and expect the children to use it in their verbal and written explanations.

We have high expectations of all children, irrespective of ability. We endeavour to set work that is challenging, motivating and encourages our children to talk about what they have been learning.

## TEACHERS' PLANNING AND ORGANISATION

The approach to the teaching of mathematics within the school is based on:

- a concise scheme of work and a set of medium term plans for each year group. These planning documents follow the mastery approach to learning mathematics, with a focus on the key areas of **fluency**, **reasoning** and **problem-solving**. Each scheme of work provides an overview of all statutory requirements for that specific year group. The schemes are based on 'block' teaching which ensures that the children have time to become fluent in the concepts taught. Once they are secure in these concepts, they will then also have time to apply and embed their learning at a greater depth level. Timescales for each topic are provided but may need to be adapted to suit the particular needs of a cohort. The scheme of work ensures complete curriculum coverage for each year group and it provides a clear structure from which more-detailed medium term plans have been formulated. The medium term plans for each year group ensure a clear progression in skills as the children progress through the school.
- a mathematics lesson every day (of an age appropriate length)
- a clear focus on direct, instructional teaching and interactive work with both the whole class and smaller ability groups
- a maths calculation policy which is used throughout the school to ensure the continuing and gradual development of number skills (see **Appendix 1 and 2**)



It is expected that staff will utilise a range of resources to deliver their lessons, to ensure that there is suitable challenge for all. In line with our mastery approach to teaching mathematics, all teaching staff have been provided with the White Rose Hub Maths Mastery documents as well as access to NCETM resources; these can be used in collaboration with the Abacus resources to plan lessons (Abacus provides a range of structured, differentiated activities that encompass the aims and content of Primary National Curriculum 2014).

### **CALCULATION POLICY**

The school has a policy regarding the teaching of calculations, which ensures the progression in calculations from Year 1 to Year 6 (**see Appendix 1 for a summary of the calculation policy; see Appendix 2 for a copy of the calculation policy**). We begin teaching each of the four operations by focussing on mental skills, which provide the foundation for jottings and informal written methods of recording. These skills lead on to more formal written methods of arithmetic calculation. We believe that the transition between stages should not be hurried as not all children will be ready to move on to the next stage at the same time. Previous stages may need to be revisited to consolidate understanding when introducing a new strategy.

### **LEARNING SUPPORT ASSISTANTS**

Time should be set aside prior to the maths lesson for the teacher to discuss the learning objectives and activities with the LSA, making clear the LSA's role in supporting the children. LSAs should support individuals or small groups of children during the lesson and make observational notes on focus children. In most cases, LSAs should be given the opportunity to work with different ability groups throughout the week.

### **EQUAL OPPORTUNITIES**

All children should have equal access to the curriculum, irrespective of particular circumstances such as race, background, gender and capability. In the daily mathematics lesson, we support children in a variety of ways: repeating instructions, speaking clearly, emphasising key words, providing task planners, creating word banks, using picture cues, playing mathematical games, encouraging children to join in counting, chanting, finger games, rhymes, etc.



It is also ensured that all children, irrespective of learning ability, are provided with the same opportunities to develop their problem solving and reasoning skills; differentiated problems are provided whereby all pupils are moved beyond the fluency stage to the application stage in their learning.

### **SPECIAL EDUCATIONAL NEEDS AND DISABILITIES (SEND)**

Children with SEN are normally taught within the daily mathematics lesson. The teacher will provide appropriately differentiated learning activities to meet the needs of all children; this will include a range of opportunities to solve problems and reason with others about solutions or chosen strategies.

When additional staff are available to support groups or individual children, they may withdraw small groups to use intervention materials.

### **HIGH ACHIEVING CHILDREN**

Children who are high achievers in mathematics will be taught within their own class and stretched through differentiated group work and extra challenges. When working with the whole class, teachers or LSAs will direct targeted questions towards the more able children to maintain their involvement.

### **CROSS-CURRICULAR TEACHING**

Mathematical concepts are taught mainly discreetly but the using and applying of mathematics should be linked to all subject areas, where appropriate. Throughout the whole curriculum opportunities exist to extend and promote mathematics and we seek to take advantage of all these opportunities within our Creative Curriculum. We also draw children's attention to the links between mathematics and other curricular work, for example, handling data in science. We want children to understand that mathematics is not an isolated subject.

### **ICT**

Effective use of ICT can enhance the teaching and learning of mathematics when used appropriately. Each classroom has an interactive whiteboard (SmartBoard) and a visualiser. All teachers are provided with a laptop to support their planning and provision and are encouraged to use ICT to enhance teaching and learning. Teachers can use software to present information visually, dynamically and interactively. The school subscribes to Abacus which provides a range of interactive teaching tools for the interactive whiteboard.



## **PUPILS' RECORDS OF THEIR WORK**

All children are encouraged to work neatly when recording their work in exercise books.

In KS1, children must:

- write the short date (dd/mm/yy)
- refer regularly to their 'Steps to Success'
- respond to their teacher's feedback marking (in verbal or written form)

In KS2, children must:

- use a ruler to draw a margin of 2 squares
- Write the date and underline with a ruler
- use one square per digit written
- refer regularly to their 'Steps to Success' as a self-assessment tool
- respond to their teacher's feedback marking (in verbal or written form)

## **MARKING AND FEEDBACK**

The quality of marking is crucial. Please refer to the school's *Marking and Feedback* policy. This policy provides a framework for marking and feedback which enables all staff and children to consistently evaluate the learning taking place. When appropriate, the children themselves can mark exercises which involve routine practice with support and guidance from the teacher. Where verbal feedback has been given, this should be indicated on a child's work (e.g. 'VF').

## **EARLY YEARS FOUNDATION STAGE (EYFS)**

Teachers of the Reception children base their teaching on objectives in the 'Statutory framework for the early years foundation stage' (DFE, 2014), ensuring that they are working towards the 'Early Learning Goals' for Mathematics.

The children are given rich opportunities to develop their understanding of number, calculating, measuring, pattern and shape and space through structured and child-initiated learning activities both indoors and out. This enables children to enjoy, explore, learn, practise and talk about their developing understanding of mathematics.

## **ASSESSMENT**

Assessment is regarded as an integral part of teaching and learning and is a continuous process. It is the responsibility of the class teacher to assess all the children in their class.



Formative assessment (*Assessment of Learning*) will be an informal part of every lesson to check understanding against the learning objectives. This gives the teacher information which will help to adjust daily lesson plans.

Summative assessments will take place at the end of every term or at the end of a topic, as appropriate, and are used to measure children's attainment and progress, inform planning and identify learning gaps. Each child's attainment and progress is reported to the Head Teacher at the end of every term.

Compulsory end of Key Stage SATs will take place at the end of Years 2 and 6.

Children's progress is reported to parents in the Autumn and Spring term at Parents' Evenings. At the end of every year, each child's attainment in mathematics is included as part of their annual written report.

## **MONITORING AND EVALUATION**

The Maths Leader is released regularly from his classroom in order to work alongside other teachers. This time is used to monitor and evaluate the quality and standards of mathematics throughout the school and enables the Maths Leader to support teachers in their own classrooms. The Maths Leader monitors teaching and learning in mathematics through drop-in observations, formal lesson observations, 'book looks', pupil progress meetings, pupil conferencing and analysing assessment data.

## **RESOURCES**

Resources for the delivery of the mathematics curriculum are stored both centrally and within classrooms. Practical resources which are used regularly to support the daily maths lesson (such as number lines, counters, 100 squares, textbooks, etc.) are stored within each classroom. Resources which are not used or required regularly are stored centrally in the main resource area upstairs in the Resource Room.

Teachers should also make use of ICT tools to enhance learning where appropriate, e.g. using the Abacus interactive tools on the IWB.

## **HOMEWORK**

All homework given reflects work covered in class and is differentiated according to the needs and abilities of the children. Children are usually given one piece of maths homework every week. The format of the homework will be at the discretion of the class teacher. Not all homework is written work. Feedback will be given to children, as appropriate.



In addition, it is expected that children at all ages will be encouraged to regularly revise number bonds, multiplication and division facts and practice a range of everyday mental maths challenges.

Each year, the children from Years 2-6 are also given the opportunity to participate in the 'Multiplication Challenge' which helps to promote the learning of multiplication tables outside of school.

### **PROMOTING MATHEMATICS**

Each classroom has a 'Working Wall' that is used by the teacher to plot the learning journey for the particular mathematical topic being taught. This wall will typically include key vocabulary and definitions, modelled examples of key concepts/methods of calculation, questions created by the pupils and/or teacher and pictures to inspire and engage the pupils. It should be an interactive resource whereby the children can add to it as the topic progresses.

In addition to this, each classroom has a display board that is used to present and celebrate examples of excellent mathematics, much in the same way as literacy or art displays. This display is updated regularly with copies of completed work from books, photographs of group problem-solving or clear and accurate workings from test papers.

### **ROLE OF THE MATHS LEADER**

- Promoting the value of mathematics at all levels
- Preparing policy documents
- Advising colleagues and helping to develop expertise
- Observing colleagues and monitoring planning and quality of teaching
- Making purchasing decisions
- Keeping updated on new policies, initiatives or pedagogy and sharing this with colleagues
- Ensuring that mathematics is actively promoted within the school and the local community (e.g. through the use of display boards; through participation in local mathematics competitions)
- Attending Full Leadership Team meetings to feedback on new initiatives, etc.
- Liaising with the Head Teacher, Deputy Head and Governors as appropriate (subject leader reports are produced every term for the Governors on the Teaching and Learning Committee)

**Policy agreed: July 2017**

**Policy review: July 2020**



## APPENDIX 1:

### Year 1-6 Progression in Calculations

|                       | Year 1   | Year 2   | Year 3  | Year 4  | Year 5  | Year 6   |
|-----------------------|--|--|---|---|---|--|
| <b>Addition</b>       | Combining two parts to make a whole: part whole model.<br><br>Starting at the bigger number and counting on.<br><br>Regrouping to make 10. | Adding three single digits.<br>Column method – no regrouping.  | Column method- regrouping.<br>(up to 3 digits)  | Column method- regrouping.<br>(up to 4 digits)  | Column method- regrouping.<br>(with more than 4 digits)<br>(Decimals- with the same amount of decimal places)     | Column method- regrouping.<br>(Decimals- with different amounts of decimal places)   |
| <b>Subtraction</b>    | Taking away ones<br>Counting back<br>Find the difference<br>Part whole model<br>Make 10  | Counting back<br>Find the difference<br>Part whole model<br>Make 10<br>Column method- no regrouping  | Column method with regrouping.<br>(up to 3 digits)  | Column method with regrouping.<br>(up to 4 digits)  | Column method with regrouping.<br>(with more than 4 digits)<br>(Decimals- with the same amount of decimal places) | Column method with regrouping.<br>(Decimals- with different amounts of decimal places)   |
| <b>Multiplication</b> | Doubling<br>Counting in multiples<br>Arrays (with support)   | Doubling<br>Counting in multiples<br>Repeated addition<br>Arrays- showing commutative multiplication | Counting in multiples<br>Repeated addition<br>Arrays- showing commutative multiplication<br>Grid method             | Column multiplication<br><br>(2 and 3 digit multiplied by 1 digit)  | Column multiplication<br><br>(up to 4 digit numbers multiplied by 1 or 2 digits)                                  | Column multiplication<br><br>(multi digit up to 4 digits by a 2 digit number)  |
| <b>Division</b>       | Sharing objects into groups<br>Division as grouping  | Division as grouping<br>Division within arrays   | Division within arrays<br>Division with a remainder<br>Short division (2 digits by 1 digit- concrete and pictorial) | Division within arrays<br>Division with a remainder<br>Short division (up to 3 digits by 1 digit- concrete and pictorial) | Short division<br><br>(up to 4 digits by a 1 digit number interpret remainders appropriately for the context)     | Short division<br>Long division<br>(up to 4 digits by a 2 digit number- interpret remainders as whole numbers, fractions or round) |