2023

Mathematics policy for Witton Church Walk Primary School.

Governors, parents and school staff worked together to agree a vision for Witton Church Walk Primary School which they felt was represented in the following quotation…..

'Where Every Door is Opened and Every Gift is Unlocked'

To elaborate on this…At Witton we are a partnership of school, church, home and community. We create a stimulating and caring environment, grounded in Christian belief and practice, so that all members of our school community feel happy, safe and secure. Time is taken to value and nurture each child educationally, creatively and spiritually. Children and staff are encouraged to aim for 'Everyday Excellence' and believe in themselves in order to achieve their full potential.

This policy should be read in conjunction with the following school policies:

Calculation Policy

Curriculum Policy

Assessment Policy

Marking Policy

Special Needs Policy

Equality, Diversity & Community Policy

Introduction.

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.

Mathematics is an interconnected subject in which pupils need to be able to move fluently between representations of mathematical ideas. The programmes of study are, by necessity, organised into apparently distinct domains, but pupils, through good teaching and learning experiences, should make rich connections across mathematical ideas to develop fluency, mathematical reasoning and competence in

solving increasingly sophisticated problems. They should also apply their mathematical knowledge to science and other subjects.

The national curriculum for mathematics reflects the importance of spoken language in pupils' development across the whole curriculum – cognitively, socially and linguistically. The quality and variety of language that pupils hear and speak are key factors in developing their mathematical vocabulary and presenting a mathematical justification, argument or proof. They must be assisted in making their thinking clear to themselves as well as others, and teachers should ensure that pupils build secure foundations by using discussion to probe and remedy their misconceptions.

Aims and objectives

We aim to provide the children with a teaching for mastery mathematics curriculum which will allow them to become confident individuals through developing their mathematical skills to their full potential. We also aim to present maths as a challenging, exciting, creative and relevant subject in order to promote a positive and confident attitude.

Witton Church Walk Primary School values the individuality of all children. We are committed to giving all of our children every opportunity to achieve the highest of standards. We do this by taking account of pupils' varied life experiences, needs and starting points. We offer a broad and balanced curriculum and have high expectations for all children. In line with the Equality Act 2010, our school promotes the individuality of all of our children, irrespective of ethnicity, attainment, age, disability, gender or background. The social, moral, spiritual, cultural and our Christian values will be strengthened as our curriculum enables the children to understand the fundamental British values of democracy, the rule of the laws, individual liberty and mutual respect and tolerance of those with different faiths and beliefs.

Our school aims to be an inclusive school. We actively seek to remove the barriers to learning and participation that can hinder or exclude pupils. This means that equality of opportunity must be a reality for our children. We make this a reality through the attention we pay to the different individual and groups of children within our school to ensure minimal risk of underachievement.

Through the delivery of the maths framework our pupils should:

- Become fluent in the fundamental of mathematics, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately.
- Develop a sense of the size of a number and where it fits into the number system.
- Know by heart and develop rapid recall of number facts such as number bonds, multiplication tables, doubles and halves.
- Use what they know by heart to figure out numbers mentally developing an understanding of number patterns and relationships.
- Calculate accurately and efficiently, both mentally and in writing, drawing on a range of calculation strategies.
- Make sense of number problems and recognise the operations needed to solve them,
- Reason mathematically; explain their methods and reasoning using correct mathematical terms.
- Judge whether their answers are reasonable and have strategies for checking them where necessary.
- Suggest suitable units for measuring and make sensible estimates of measurements.
- Explain and make predictions from the data in graphs, diagrams, charts and tables.

- Develop spatial awareness and an understanding of the properties of 2d and 3d shapes.

Promotion of high standards

While striving for higher mathematical standards the following factors will apply;

- the Head Teacher will provide active leadership and set high expectations of achievement by staff and children;
- the subject leader has the expertise, opportunity and gives support needed to influence practice and further develop the knowledge of all staff;
- a desire to secure high standards through effective teaching and learning that pervades the whole school;
- there is a systematic approach to teaching, planning, assessment, monitoring, moderation and reviews of planning;
- there is a whole school approach to professional development of staff with the emphasis on developing knowledge of the Mathematics curriculum;
- Teaching assistants are deployed effectively in order to support teachers and pupils effectively, providing maximum impact on learning;
- Parents/carers are kept informed and are encouraged to work with children at home;
- Governors are involved in monitoring and evaluation.

Teaching for Mastery Principles

- Teaching is underpinned by a belief in the importance of mathematics and that the vast majority of children can succeed in learning mathematics in line with national expectations for the end of each key stage.
- The children are taught in year groups, not classes. The learning needs of individual pupils are addressed through careful scaffolding, skilful questioning and appropriate rapid intervention, in order to provide the necessary support and challenge.
- Factual knowledge (e.g. number bonds and times tables), procedural knowledge (e.g. formal written methods) and conceptual knowledge (e.g. of place value) are taught in a fully integrated way and are all seen as important elements in the learning of mathematics.
- The reasoning behind mathematical processes is emphasised. Teacher/pupil interaction explores in detail how answers were obtained, why the method/strategy worked and what might be the most efficient method/strategy.
- Interim methods (e.g. expanded methods for addition and multiplication) to support the development of formal written algorithms are used for a short period only, as stepping stones into efficient, compact methods.
- Precise mathematical language, coached in full sentences, is always used by teachers, so that mathematical ideas are conveyed with clarity and precision. Pupils are required to do the same (e.g. when talking about fractions, both the part and its relationship to the whole are incorporated into responses: “The shaded part of the circle is one quarter of the whole circle”).
- Conceptual variation and procedural variation are used throughout teaching, to present the mathematics in ways that promote deep, sustainable learning.
- Carefully devised exercises employing variation are used. These provide intelligent practice that develops and embeds fluency and conceptual knowledge.
- Sufficient time is spent on key concepts (e.g. multiplication and division) to ensure learning is well developed and deeply embedded before moving on.

Curriculum design

- Programmes of study and lesson content are carefully sequenced, in order to develop a coherent and comprehensive conceptual pathway through the mathematics.
- Learning is broken down into small, connected steps, building from what pupils already know.
- Children are allowed time to reflect on new concepts.
- Difficult points and potential misconceptions are identified in advance and strategies to address them planned.
- Key questions are planned, to challenge thinking and develop learning for all pupils.
- Contexts and representations are carefully chosen to develop reasoning skills and to help pupils link concrete ideas to abstract mathematical concepts.
- The use of high quality materials and tasks to support learning and provide access to the mathematics is integrated into lessons. These may include visual images and concrete resources.

We teach Mathematics in our Foundation Stage classes. As the class is part of the Foundation Stage, we relate the mathematical aspects of the children's work to the objectives set out in the prime and specific areas of learning, which underpin the curriculum planning for children aged birth to five. We give all the children ample opportunity to develop their understanding of number, measurement, pattern, shape and space through varied activities that allow them to enjoy, explore, practise and talk confidently about Mathematics.

See Appendix 1 for information on each year group

Features of teaching

- Lessons are sharply focused; digression is generally avoided.
- 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 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 in detail and working together to improve their practice
- The same structure is to be used in each year group to ensure consistency.

Lesson Structure (See Appendix 2)

- The beginning of each lesson which focus on consolidating prior strategies through the use of fluent in five.
- In lessons there are opportunities for exploration, structuring, documenting, practice and reflecting.
- An anchor task is used to engage the children in their learning and children are given time to explore the problem (often with concrete materials).
- This problem is discussed deeply and structured by the teacher, using the children's methods when possible, to investigate different ways to solve it. Children evaluate the methods themselves and to try to visualise.
- Enrichment is used over acceleration. Higher attainers should be able to show recordings in more than one way, different possibilities, explain it as a story, verbalise thinking methods and reason ideas etc.
- Guided practice allows children to practice and apply their new knowledge (and methods) to different problems, with support as needed from a peer or adult.
- Children should then be able to apply their understanding to independent tasks, which will need them to use what they have learnt to answer different questions. This may be in a separate practice lesson.

Children with Special Educational Needs (SEN)

Mathematics forms part of the school curriculum policy to provide a broad and balanced education to all children. Through our Mathematics teaching we provide learning opportunities that enable all pupils to make progress. We do this by setting suitable learning challenges and responding to each child's different needs. Assessment against the National Curriculum allows us to consider each child's attainment and progress against expected levels.

When progress falls significantly outside the expected range, the child may have special educational needs. Our assessment process looks at a range of factors – classroom organisation, teaching materials, teaching style, or differentiation – so that we can take some additional or different action to enable the child to learn more effectively. This ensures that our teaching is matched to the child's needs.
Children who have been identified as SEN support and have specific learning difficulties in maths will be highlighted on the SENCos provision map**.** Children who have an education healthcare plan may need added support in Mathematics, as defined through the objectives of their plan.

We enable pupils to have access to the full range of activities involved in learning Mathematics.
Where children are to participate in activities outside the classroom, for example, a maths trail, we carry out a risk assessment prior to the activity, to ensure that the activity is safe and appropriate for all pupils.

Assessment and recording

Short-term assessments are used to help us adjust our daily plans. These short term assessments are closely matched to the teaching objectives and are fed back appropriately to children in their books with specific next step marking or through discussion. These should be linked to the Learning Objective/Stem sentence for the lesson. Teaching to identified pupils can take place prior to the lesson so that pupils are more likely to be able to access what is being taught if this takes place.

Medium-term assessments are used to measure progress against the key objectives, and to help us plan the next unit of work. We use a variety of written methods for this, including using detailed objective trackers via Insight tracking. End of unit assessments are used to highlight progress and are the basis for the half-termly Pupil Progress monitoring.

Long-term assessments are carried out towards the end of the school year; these are used to assess progress against school and national targets. Targets for the next school year are set and make a summary of each child's progress before discussing it with parents. We pass this information on to the next teacher at the end of the year, so that s/he can plan for the new school year. We make the long-term assessments with the help of end-of-year tests and teacher assessments. We use the national tests for children in Year 2 and 6 plus the use of optional nfer tests for children at the end of Years 3, 4 and 5. We also make annual assessments of children's progress measured against the level descriptions of the National Curriculum.
In addition to these we also track the pupil's maths ages through the use of a standardised test each term.

Monitoring and review

Monitoring of the standards of children's work and of the quality of teaching in mathematics is the responsibility of the mathematics subject leader. The work of the mathematics subject leader also involves supporting colleagues in the teaching of mathematics, being informed about current developments in the subject, and providing a strategic lead and direction for the subject in the school.
The mathematics subject leader gives the Head Teacher a termly and end of year summary in which s/he evaluates strengths and weaknesses in the subject and indicates areas for further improvement. The Head Teacher allocates regular management time to the mathematics subject leader so that s/he can review samples of children's work and undertake lesson observations of mathematics teaching across the school. These methods have a clear focus on the following aspects:

- Progress
- Progression
- Conceptual understanding
- Problem solving
- Addressing misconceptions
- Reasoning and language
- Use of models and images
- Regularity
- Breadth and depth

A specific member of the school's governing body is briefed to oversee the teaching of maths and meets with the subject leader once every half term. They then report back to the governors at the full governing body committee meeting each term.

Signed -

Date:

Review Date:

Appendix 1

CLASS	HOW THE CHILDREN WILL BE TAUGHT
NURSERY	The prime areas are the main focus in nursery, however, both the indoor and outdoor environment provide opportunities for maths on a daily basis. When a child is identified as being secure in the prime areas/or in the summer term for school starters, specific areas will be taught as a focus.
RECEPTION	The children receive whole class direct teaching as well as small group teaching with a focus on progressing through the development matters statements, to ensure children progress towards ELG. Both the indoor and the outdoor environment with EYFS are enriched with open ended resources to stimulate and challenge the children.
Year 1	The children will begin the year working on the schools own must do curriculum as a number of the children did not achieve GLD at the end of reception. Once they are ready they will begin to work on the mastery approach and complete practical activities as part of their guided practice – This is to be agreed by the maths lead and the EYFS lead. The expectation is that it is started after the October half term.
Year 1/2	The children will be taught the mastery approach from the beginning of the term. They will be taught using a staged input to ensure that the children are taught the correct year group objectives at the level expected of them.
Year 2	The children will be taught the mastery approach from the beginning of the term.
Year 3/4	The children will be taught in three classes. One will focus on teaching the year 4 objectives, one teaching the year 3 objectives and one class of year 3 and 4 children who will be working on previous year groups objectives as they are working well below the expected standard for their year group and did not achieve the expectation in their previous year group.
Year 5/6	The children will be taught in 3 groups. One will consist of a class of year 5 children who are able to access the curriculum at their own level. One group will consist of a group of year 5 and year 6 children who are working below the expected standard for their year group. One will be a class of year 6 children who are working at the expected standard.

KS1 and KS2 maths lesson structure

	Purpose	Adults will be:
Fluency	• Checking on prior learning • Reinforcing strategies – including mental • Familiarity with facts • Making links to current learning focus	• Checking pupil fluency • Supporting those children who have been identified as needing it
Context to introduce lesson	• Use of an anchor task to explore real life problems • Check what maths they already now that is related and work out what they need to know in order to answer the question. • Time to explore strategies • Opportunity to address misconceptions as a teaching approach	• Helping pupils to identify the information needed to answer the question • Additional adults supporting where they have been directed (based on need) • Listening to the strategies that the children are suggesting and addressing any misconceptions that may arise • Breaking down the task and using scaffolding to support
Teacher instruction	• Explain the problem, introducing the maths for the lesson • Show and model strategies and approach to be used • Scaffold and break down the problem	• Using rich vocab questions to support the children in their understanding • Guiding the children through the question
Guided practice	• Explore together, beginning to work more independently in maths journals/jotters. • Use of stem sentences to support when needed • Time for reasoning, how do you know? • Use of non-examples, planning for variation and modeling misconceptions through questions	• Using rich vocab questions to support the children in their understanding • Using stem sentences to support the children in their reasoning responses • Exploring misconceptions through the use of visual and verbal questions. • Additional adults continuing to support, providing wave 1 intervention where needed • Teachers observing both written and verbal response and acting on this information appropriately • A ping pong approach being used by the teacher
Independent work	• Time to apply knowledge to varied fluency questions, see patterns and make connections • Reasoning and problem solving questions included (All children to work on, sometimes as a reflect task and done collaboratively with the teacher)	• Helicopter approach being used by the teacher in order to address any misconceptions and allow children to know if they are answering the questions correctly. • Teacher working with a group at the end of the lesson to provide support for the reflection/challenge task to ensure all 'having a go'