THOMAS BULLOCK CE PRIMARY AND NURSERY ACADEMY

'Let your light shine.' Matthew 5:16

Mathematics

"Go down deep enough into anything and you will find Mathematics"
Dean Schlicter

Vision and Values

Maths lessons are delivered as part of the curriculum offer, using White Rose as a resource to support our planning and progression. The Objectives for the lessons are underpinned by the National Curriculum. Maths lessons at Thomas Bullock are well planned and structured to ensure that new skills are learnt and imparted through effectively teaching a sequence of lessons, therefore, developing pupils' **fluency**, **problem solving** and **reasoning** skills. Children learn and internalise key vocabulary for their lessons and are provided with a weekly growing list, specific to their lesson, that is displayed clearly on their working walls within their classroom. Children are encouraged to have **courage** and to challenge themselves to apply what they know to trickier problems giving them ownership of their learning and building on their resilience, **perseverance** and confidence to achieve. Where possible, lessons are taught in an interactive way providing children with a context that makes use of the children's experiences and links with their wider learning. Children have access to TTRS to allow them to work on their times tables from home in a fun and engaging way and allowing them to take **responsibility** for their home learning. We strive to engage children with a range of different experiences that transcend across cultural divides and offer pupils a rich and deep experience of understanding the power of Maths and ultimately supporting them to **"let their light shine".**

The aims and objectives of Mathematics are in line with the National Curriculum and enable children to:

- 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, justification or proof using mathematical language.
- **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.

Intent

Mathematics is an important creative discipline that helps us to understand and change the world. We want all pupils at Thomas Bullock C of E Primary and Nursery Academy to experience the power and enjoyment of mathematics and develop a sense of curiosity about the subject with a clear understanding. We foster a positive mind-set that all children can achieve in mathematics, as well as, teach for secure and deep understanding of mathematical concepts through manageable steps in line with the Mastery approach. We use mistakes and misconceptions as an essential part of learning and provide challenges through rich and sophisticated problems. At our school, the majority of children will be taught the content from their year group only, spending time becoming true masters of content, applying and being creative with new knowledge in multiple ways.

Implementation

At Thomas Bullock our whole curriculum is shaped by our school vision which aims to enable all children, regardless of background, ability, additional needs, to flourish to become the very best version of themselves they can possibly be and to **"let their light shine"**. We teach the National Curriculum through the White Rose scheme as a resource supported by a clear skills and knowledge progression. This ensures that skills and knowledge are built on year by year and sequenced appropriately to maximise learning for all children.

In the Early Years pupils are taught to:

- Count reliably with numbers from one to 20, place them in order and say which number is one more or one less than a given number.
- Use quantities and objects, to add and subtract two single-digit numbers and count on or back to find the answer.

- Solve problems, including doubling, halving and sharing.
- Use everyday language to talk about size, weight, capacity, position, distance, time and money to compare quantities and objects and to solve problems.
- Recognise, create and describe patterns.
- Explore characteristics of everyday objects and shapes and use mathematical language to describe them

In Key Stage 1 pupils are taught to:

- Develop confidence and mental fluency with whole numbers, counting and place value. This involves working with numerals, words and the four operations, including with practical resources [for example, concrete objects and measuring tools].
- Develop their ability to recognise, describe, draw, compare and sort different shapes and use the related vocabulary.
- Use a range of measures to describe and compare different quantities such as length, mass, capacity/volume, time and money.
- The number bonds to 20 and be precise in using and understanding place value.
- Read and spell mathematical vocabulary, at a level consistent with their increasing word reading and spelling knowledge at key stage 1.

In Lower Key Stage 2 pupils are taught to:

- Become increasingly fluent with whole numbers and the four operations, including number facts and the concept of place value.
- Develop efficient written and mental methods and perform calculations accurately with increasingly large whole numbers.
- Develop their ability to solve a range of problems, including with simple fractions and decimal place value. Draw with increasing accuracy and develop mathematical reasoning so they can analyse shapes and their properties, and confidently describe the relationships between them.
- Use measuring instruments with accuracy and make connections between measure and number. Memorise their multiplication tables up to and including the 12-multiplication table and show precision and fluency in their work.
- Read and spell mathematical vocabulary correctly and confidently, using their growing word reading knowledge and their knowledge of spelling.

In Upper Key Stage 2 pupils are taught to:

- Extend their understanding of the number system and place value to include larger integers.
- Develop the connections that pupils make between multiplication and division with fractions, decimals, percentages and ratio.
- Develop their ability to solve a wider range of problems, including increasingly complex properties of numbers and arithmetic, and problems demanding efficient written and mental methods of calculation.
- Use the language of algebra as a means for solving a variety of problems. Teaching in geometry and measures should consolidate and extend knowledge developed in number.
- Classify shapes with increasingly complex geometric properties and that they learn the vocabulary they need to describe them.
- Be fluent in written methods for all four operations, including long multiplication and division, and in working with fractions, decimals and percentages.
- Read, spell and pronounce mathematical vocabulary correctly

Lessons are taught in a specific order to support the Mastery of the subject.
This order is:

1. Introduction of WALT and WILF (Learning objectives and success criteria
2. Explanation of Vocabulary
3. Flashback 4 (recap of previous learning)
4. Maths Talk (Teaching and child practice)
5. Independent activity
6. Reason together
7. Reasoning and Problem Solving independently

Children work in mixed ability pairs to support their journey to become independent learners and problem solvers through peer support in the lesson enabling all children to succeed. We encourage children to find the answers to questions, proving and explaining their working out.
In addition to this, children are exposed to daily “Number Ninjas' ' sessions before the main Maths lessons which focuses specifically on arithmetic and fluency skills. They are also taught short maths meetings to consolidate learning from the week involving reasoning and problem solving or tackling misconceptions.

Impact

At Thomas Bullock our approach to the mathematics curriculum enables children to show confidence in believing that they will achieve each lesson. They are able to become flexible and able to fluidly move between contexts and different representations of maths, as well as, develop the ability to recognise relationships and make connections between numbers. The children are able to move towards mastering mathematical concepts or skills by showing their working in a variety of ways, using the mathematical language taught to explain their ideas and independently apply the concept to new problems. White Rose Maths used as a planning resource alongside the NCETM resources ensures that all children experience challenge and success in Mathematics by developing a growth mindset. Children are taught to have a high level of pride in the presentation and understanding of their work. At Thomas Bullock, we recognise that in all classes there are children of widely- different abilities in Maths and we seek to provide suitable learning opportunities for all children by matching the challenge of the task to the ability of the child. We achieve this by:

- setting common tasks which are open-ended and can have a variety of responses;
- setting tasks of increasing difficulty that allows children to deepen their understanding
- providing resources of different complexity to suit the needs of the child
- allowing time for peer- to- peer discussion frequently
- class teacher making appropriate arrangements to accommodate any specific special educational needs.
- Implementing SMART interventions through PIXL, we aim to close the gap and support others to access learning in their lessons building on their independence.

Spiritual Development

At Thomas Bullock we develop deep thinking and encourage the questioning of the way in which the world works. To promote the spiritual growth of students, the awe and wonder of mathematics is shared with the children and helps to explain the world and the mathematical patterns that occur. We develop a sense of wonder and personal achievement through solving problems.

Cultural Capital links

Cultural capital is the accumulation of knowledge, behaviours, and skills that a student can draw upon and which demonstrates their cultural awareness, knowledge and competence; it is one of the key ingredients a student will draw upon to be successful in society, their career and the world of work. Throughout their time at Thomas Bullock the children are given the opportunity to develop these skills in a variety of ways:

- Learning to read timetables
- Understanding and working out distances, proportion and scale on maps by doing orienteering activities.
- Understanding probability of events.
- Visiting local shops to put in use their skills of calculating and budgeting with money, including solving percentages for sales price, original costs and best buys.
- Learning and extending their knowledge of real-life jobs which use mathematics and the mathematicians that have had an impact on society such as Katherine Johnson, Isaac Newton, Albert Einstein etc through a maths whole school day and linking this to STEM.