



Curriculum Intent for maths

Vision:

Building a Hopeful Future through Kindness, Learning and Trust

At Kirkby la Thorpe, we strive to ensure that each person is empowered to flourish and contribute positively to society. We seek to equip our pupils with the knowledge, skills and qualities necessary to navigate the complexities of our world, rooting this in Christian love.

We are inspired by the life of St Thomas in all that we do so that we can:

- **Be Positive and Active Citizens:** "Let your light shine before others, that they may see your good deeds and glorify your Father in heaven." (Matthew 5:16) We strive for our pupils to communicate clearly, embracing tolerance and respect for the diverse beliefs and aspirations of others.
- **Be Curious and Independent Members of Society:** "Ask and it will be given to you; seek and you will find; knock and the door will be opened to you." (Matthew 7:7) We encourage curiosity and a thirst for knowledge, instilling a longing for justice and an empathy for those in need.
- **Have Confidence and Perseverance:** "For God gave us a spirit not of fear but of power and love and self-control." (2 Timothy 1:7) We empower everyone to embrace challenges with confidence and perseverance, striving to achieve their full potential in all aspects of life.
- **Have the Courage to Respectfully Challenge :** "Instead, speaking the truth in love, we will grow to become in every respect the mature body of him who is the head, that is, Christ." (Ephesians 4:15) We foster an environment where respectful dialogue and critical thinking are encouraged, empowering pupils to voice their opinions with courage and integrity.
- **Know their heritage:** "Remember the days of old; consider the generations long past. Ask your father and he will tell you, your elders, and they will explain to you." (Deuteronomy 32:7) We cultivate an appreciation for both local and national heritage, helping pupils understand their roots and identity within the broader context of history.

<p>Kindness</p> <p>Working together on complex problems, emphasising teamwork, and valuing each other's input.</p> <p>Assist classmates who are struggling with their studies or personal issues.</p> <p>Listen to each others responses and mathematical justifications and ideas</p>	<p>Learning</p> <p>New concepts are modelled by teachers and are used by children</p> <p>Children use the vocabulary associated with Maths</p> <p>Patterns and solutions are identified</p> <p>Be Open-minded to challenges that might think are not achievable, yet</p>	<p>Trust</p> <p>Check answers and working out to ensure accuracy and reliability of answers</p> <p>Learn from mistakes and willing to take risks</p> <p>Evaluate own and each other's work, learning to trust and respect peer abilities and answers</p>
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Intent	Implementation	Impact
<p>We intend that our Maths curriculum will:</p> <ul style="list-style-type: none"> • Ensure our children have access to a high-quality Maths curriculum that is challenging, enjoyable and fosters a real sense of curiosity. • Provide our children with a variety of mathematical opportunities, which will enable them to make the connections in knowledge needed to enjoy a greater depth of learning. • Develop fluency, mathematical reasoning and competence in solving increasingly sophisticated problems. • Ensure our children are confident, resilient mathematicians who are not afraid to take risks. 	<p>Curriculum Content</p> <p>At Kirkby la Thorpe, we believe that all children can achieve in Mathematics. We adopt a 'Teaching maths for mastery' approach in our classrooms. This is a research-based approach to maths teaching which stems from high performing Asian nations. We follow the National Curriculum and use White Rose for Nursery and Power Maths for the rest of the year groups. In addition, White Rose learning is used to supplement Power Maths as together they provide a sequential approach to learning.</p> <p>Mastery in the classroom</p> <p>We adopt a 'Teaching maths for mastery' approach in our classrooms. This is a research-based approach to maths teaching which stems from high performing Asian nations. When children are taught to 'master maths', they develop a deep, long-term and adaptable understanding of the subject. The whole class moves through the teaching of different mathematical concepts at broadly the same pace, yet each topic is studied in depth and the teacher does not move to the next stage until the children demonstrate that they have a secure understanding of them. Students are given time to think deeply about the maths and really understand concepts. This slower pace leads to greater progress because it ensures that students are secure in their understanding before moving on.</p> <p>To embed mastery, the concrete, pictorial and abstract approach is adopted to ensure that the children have a secure understanding of number from an early age. Using this approach provides children with the opportunity to explore and demonstrate mathematical ideas,</p>	<p>By the time pupils leave Kirkby la Thorpe at the end of Y6, they will:</p> <ul style="list-style-type: none"> • Have fostered a love of Maths which allows and encourages them to be curious. • Have the foundations and knowledge for understanding the world. • Have an appreciation of the beauty and power of mathematics and a sense of enjoyment and curiosity about the subject. • Have the ability to reason mathematically, • Be resilient, highly motivated to succeed and achieve in their mathematical learning. • Meet/ close to national expectation in KS2 data

<ul style="list-style-type: none"> • Develop independent learners with inquisitive minds who have secure mathematical foundations and an interest in self-improvement. • Foster a positive attitude towards mathematical concepts and be keen to explore and apply their knowledge and understanding; • Become accurate mathematicians, using precise mathematical vocabulary; • be able to communicate their mathematical thinking both verbally and in written form. 	<p>enriching their learning experience and deepening understanding. All pupils, when introduced to a key new concept, have the opportunity to build competency in this topic by taking this approach. They are encouraged to physically represent mathematical concepts. Objects and pictures are used to demonstrate and visualise abstract ideas, alongside numbers and symbols.</p> <p><u>Power Maths</u> DfE (Department of Education) recommendations, White Rose Maths is used in Nursery and Power Maths is used in Key Stage One and two to support the delivery of the National Curriculum as well as the whole-class mastery approach. This resource is written in partnership with White Rose Maths which ensures a smooth transition between phases. Power Maths is designed to spark curiosity and excitement, help nurture confidence and enable children to build upon their skills. It is taught sequentially and breaks learning into smaller steps to ensure that a deeper understanding is gained. A typical structure for these lessons is:</p> <ul style="list-style-type: none"> • Discover: Every lesson starts with a 'Discover' task which aims to generate curiosity through problem-solving. During this section the children use manipulatives to help them to understand the key concept; this aids them in articulating their method. • Share: The next stage encourages children to 'Share' the methods they have tried to solve the problem in Discover. • Think Together: We only learn when we are thinking! In this section Power Maths takes the approach "I do, we do, you do", as children apply the knowledge they have just learned in a series of problems that continue to encourage thinking throughout. • Practice: Children are then ready for some independent 'Practice'. • Reflect: The final 'Reflect' question helps the children evaluate whether they have understood the key concept and small step that they have been trying to master in the lesson <p><u>Year Group Overviews</u> Year group overviews outline the learning for each term, indicating the units and how these correlates to the National Curriculum objectives for each year group.</p> <p><u>Unit Overviews: Developing pedagogical understanding</u> As the mastery approach is underpinned by small, connected steps that gradually unfold the concept, it is vital that teaching staff have sound pedagogical knowledge. At the start of each unit the following information is provided to ensure accuracy of teaching;</p> <ul style="list-style-type: none"> • Why is this unit important; • Where this unit fits; • Assessing mastery: common misconceptions, strengthening understanding, going deeper; • Ways of working; • Structure and representations; and • Key language. <p>In addition, the Calculation policies for Key Stage 1, Lower Key Stage 2 and Upper Key Stage 2 ensure that all staff have a clear understanding of prior, current and future learning for all four operations, and the progression within pupil's learning to support and further develop pupils' learning.</p> <p><u>Key Learning Elements</u> Within Power Maths, the 'discover, share, think together, practice, reflect' sequence is adopted to deliver each learning outcome. The following elements should be in place in each lesson.</p> <p><u>Lesson Design in Maths</u> <u>Cold maths and starters-</u> are designed to revisit prior learning and support retention and fluency of key skills and number facts and are informed by ongoing Assessment for Learning. <u>Discover and Share</u> activities consist of hands-on problems which spark curiosity and provide opportunities for deeper questioning. Children share, reason, and learn from misconceptions through whole-class discussion. <u>Think Together</u> activities used to prepare the children for independent practice. These are done on whiteboards and provide children with the opportunities to try out question types prior to their independent learning.</p>	
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Independent learning- Children work through fluency, reasoning and problem-solving questions through the use of power maths and/or white rose.
Adaptation is pitched through planned opportunities to both strengthen and deepen understanding and informed by Assessment for Learning.

Key Language

Key language for a unit is introduced at the start of a sequence of lessons and displayed throughout the unit on the maths display board. This is a vital reference tool, which teachers utilise throughout each lesson, providing pupils with the vocabulary to accurately explain their thinking. Throughout all stages of a lesson, pupils are given frequent opportunities to discuss their mathematical thinking and to share this with different audiences (their partner, group, or whole class). This is a vital skill which enables pupils to make sense of their learning and to allow them to make connections.

Fluency

Following the “I do, we do, you do” approach, pupils begin to apply the strategies they have been taught to their independent work. The “I do” element of this approach plays an important role, allowing the class teacher to verbalise the strategy they are adopting and explaining why this this (‘thinking out loud’), to enable pupils to understand why some strategies are more suitable than others. The “we do, you do” questions then allow pupils to experiment with different strategies to enable them to identify the most appropriate and efficient method to solve calculations.

Mathematical Reasoning

Reasoning in maths is the process of applying logical thinking to a situation to derive the correct problem-solving strategy for a given question, and using this method to develop and describe a solution. Mathematical reasoning is the bridge between fluency and problem solving. It allows pupils to use the former to accurately carry out the latter.

Problem Solving

Problem solving in maths is finding a way to apply knowledge and skills to answer unfamiliar types of problems.

A problem is something that pupils do not immediately know how to solve. There is a gap between where they are and getting started on a path to a solution. This means that the children require the opportunity to think and play with the problem. They need to test out ideas, to go up ‘dead ends’ and adjust their thinking in the light of what they learn from this, discuss ideas with others and be comfortable to take risks. When the children are confident to behave in these ways they are then able to step into problems independently.

As teachers we can support our children to develop the skills they need to tackle problems by the classroom culture we create. It needs to be one where questioning and deep thinking are valued, mistakes are seen as useful, all children contribute and their suggestions are valued, being stuck is seen as positive and children learn from shared discussion with the teacher, support staff and peers.

The following stages are used to support pupils in their approach towards problem solving:

1. Understanding the problem: discussing with a partner; drawing a picture; using concrete apparatus to model the problem; ‘acting out’ the situation
2. Devising a strategy for solving it: considering known strategies and which may best support tackling the problem (trial and improvement; working systematically; identifying patterns; working backwards)
3. Carrying out the strategy: choosing one of the identified strategies to solve the problem
4. Checking the result: using another, different method to solve the problem – is the same answer calculated?

Maths in the Wider Curriculum

We intend for our pupils to be able to apply their mathematical knowledge across the curriculum. We want children to realise that mathematics is essential to everyday life, critical to science, technology and engineering, and necessary for financial literacy and most forms of employment. As our pupil's progress, we intend for our pupils to be able to understand the world, have the ability to reason mathematically, have an appreciation of the beauty and power of mathematics and a sense of enjoyment and curiosity about the subject.

Research links

Other aspects we consider carefully in the implementation of Mathematics include:

Links made with

- **KLT Academy Values – Kindness, Learning, Trust**
- **Oracy and Vocabulary** - 'Learning the Words to Learn' Oracy plays a key part in maths lessons, as children are encouraged to talk about the processes they have used to reach their answers. This allows staff to identify misconceptions, which in turn moves learning forwards. Teachers will encourage and promote the use of correct mathematical vocabulary at all times and in context Strategies to support pupils in becoming effective and fluent Readers.
- **Retrieval and retention strategies** – especially establishing links made with prior learning through 'cold maths' and 'starters'.
- **Experiential Learning** – Concrete, Pictorial, Abstract Whenever new concepts are introduced, we use a range of maths manipulatives (objects) to aid pupil understanding by making maths 'concrete' as opposed to 'abstract'. As children gain in confidence with each of these concepts, they will use less manipulatives and be encouraged to use pictorial representations or other written methods to show their working out.

Assessment in Maths

At Kirkby La Thorpe, we subscribe to PiXL (Partnerships in Excellence) in order to access their wealth of classroom strategies, ideas and resources that will impact on achievement, character and culture. In terms of supporting assessment for learning, PiXL Tests for mathematics are administered in Y1,3,4,5 & 6 in line with the assessment calendar published for each academic year. These tests are implemented in suitable 'test' conditions and take account of access arrangement needs such as readers, scribes, additional time and rest breaks to ensure that the outcomes of the tests are both reliable and provide accurate information for teachings. Teachers attend regular Core Team Meetings lead by the Raising Standards Lead. These meetings follow an assess/plan/do/review cycle to support pupil progress and attainment, with constant reflection and evaluation against our end of year targets. Actions agreed within these meetings inform future practice for quality first teaching, targeted intervention and curriculum review.

TTRS (Timestables Rockstars)

Children also have access to the following programmes to help support their developing number sense and arithmetical proficiency:

TTRS This is an online programme in place to support children develop fluency in early mathematics skills: This is an online programme in place to support rapid recall of Times Tables.

Inspirational Quotes.

Pure mathematics is, in its way, the poetry of logical ideas.

— **Albert Einstein, German theoretical physicist**

Without mathematics, there's nothing you can do. Everything around you is mathematics. Everything around you is numbers.

— **Shakuntala Devi, Indian writer and mental calculator**

Mathematics is the most beautiful and most powerful creation of the human spirit.

— **Stefan Banach, Polish mathematician**

We will always have STEM with us. Some things will drop out of the public eye and go away, but there will always be science, engineering, and technology. And there will always, always be mathematics.

— **Katherine Johnson, African-American mathematician**