



Townlands C of E Primary Academy

A journey of learning in the light of God's love.

Maths

The definition of a good mathematical problem is the mathematics it generates rather than the problem itself.

Andrew Wiles

Our Vision for maths

At Townlands, we believe that mathematics is essential for children and their development as it introduces them to concepts, skills and thinking strategies that are essential in everyday life, as well as supporting other areas of learning across the curriculum. Within our maths teaching, we support learners to become resilient, whilst working efficiently by making links between concepts, facts and relationships. Teachers deliver maths lessons in KS1 and KS2 by using a concrete, pictorial, abstract approach. This supports mathematical thinking, fluency, reasoning and problem solving. Maths in EYFS takes a more practical approach to the learning of mathematical skills, however opportunities are present for children to record their learning in a more formal way.

Intent

At Townlands, we teach maths every day where learning time includes the practise and the development of factual, conceptual and procedural mathematical knowledge.

The maths curriculum is underpinned by the following aims:

- To build upon children's knowledge and understanding from EYFS to year 6
- To develop resilient children who are confident and enthused about mathematics
- Become fluent in the fundamentals of mathematics; to recall and apply knowledge rapidly
- To develop conceptual understanding by using models, pictorials and concrete resources so that children understand the abstract mathematical concepts that they are learning

- To highlight and utilize relationships between concepts and procedures to develop efficiency
- To develop mathematical language to support learning and the ability to reason and justify
- To apply mathematical understanding to problem solving by breaking down problems into small steps and persevering in seeking solutions using a range of strategies
- To provide 'purposeful maths' through application of mathematical skills and knowledge to the world around them

Rationale – Why we do what we do...

After completing a maths audit with pupils and staff, we know that our children really enjoy these lessons. To support teaching and learning, we adopt the following approaches to the teaching of maths in school. The Concrete, Pictorial, Abstract (CPA) approach is used to support learning. This approach uses physical and visual aids to build a child's understanding of abstract topics. Pupils are introduced to new mathematical concepts through the use of concrete resources (e.g. Dienes blocks, place value counters, numicon). In addition, when teaching maths for mastery, we aim for the whole class to move through topics at broadly the same pace, as this supports the topic being studied in depth. Where additional support is needed for children, then this will be provided through either pre or post teaching. Maths progression grids enable teachers to plan the development of mathematical knowledge purposefully, as our grids are divided into sub categories to support progression in key areas of maths.

Enrichment

We recognise that mathematics is essential to everyday life, critical to science and technology and necessary for financial literacy. We value the importance of maths and the opportunities the subject brings in developing a broad and rich awareness of the world around us. Teachers endeavour to develop tasks which are relatable for our pupils and the community in which we teach. Examples include:

- All children design and sell a product for their family at the annual Christmas Fair, which supports an understanding of the value of money
- Children across the school vote for their school council representative and are involved in the counting of votes
- EYFS nativity performance; year 6 children help to collect monetary contributions from parents at the end of the performance
- KS2 - multiplication competitions
- Cross curricular cooking in school (apply concepts of time, measure, ratio when cooking)
- Sports day – year 6 children calculate winning team data

- We hold an annual maths Inspire morning, whereby parents/carers are invited into the classroom to participate in a maths lesson with their child/children.
- We provide our children and families with a summer activity booklet, which includes fun and educational maths activities for children to complete over the summer holidays.
- We host a new parent information session for our EYFS parents/carers, where they are introduced to an appreciation of how the school teaches maths. In year 6, a SATS meeting is held for our parents/carers so that they understand age-related expectations. These sessions are always very well attended and we have received many comments about the usefulness of these sessions.

Implementation

The teaching and implementation of the mathematics curriculum at Townlands is based on the National Curriculum; in addition, we use White Rose Schemes of Work as a guide to support teachers with their planning and assessment. We appreciate that sustained mathematical mastery takes dedicated teaching, content coverage and effective practice. Therefore, maths in our school includes daily timetabled slots which cover:

- Retrieval and fluency teaching - a fast-paced recall of facts and arithmetic skills to develop efficiency with number
- Reasoning and Problem solving teaching – units are broken down into small, focused steps of learning to support Mastery

Teaching and Learning, Content and Sequence

- The calculation policy is used within school to ensure a consistent approach to teaching the four operations over time
- At the start of each new topic, key vocabulary is introduced (see knowledge organisers) and revisited regularly to develop language acquisition, embedding as the topic progresses
- Daily opportunities are given for retrieval practice, supported by the recently introduced daily arithmetic challenge to support children in retaining fundamental key skills
- Children are taught through clear modelling and have the opportunity to develop their knowledge and understanding of mathematical concepts
- Within any lesson, children can acquire the skill, apply the skill or deepen the skill; a ceiling is not put on children's learning
- Children who have shown their understanding at a deep level within the unit will have opportunities to apply these skills with a greater depth activity
- Reasoning and problem solving are integral to the activities children are given to develop their mathematical thinking

- Children are encouraged to explore, apply and evaluate their mathematical approach during investigations to develop a deeper understanding when solving different problems/puzzles
- Mathematical resources are used throughout the school to assist in securing conceptual understanding
- A love of maths is encouraged throughout school with links to other subjects
- Children with additional needs are included/supported with appropriate scaffolding

EYFS

The EYFS areas of maths are:

- **Number** – children begin to develop their understanding of, and the composition of, numbers to 10; they learn to subitise to 5; they can recall number bonds to 5 and some number bonds to 10
- **Numerical Pattern** – they can verbally count beyond 20; compare quantities up to 10; explore and represent patterns within numbers up to 10

Children learn about maths through structured play and their daily experiences. Concrete manipulatives and pictorials are used to represent new concepts to the children, supporting their understanding, and opportunities are given for children to showcase their understanding abstractly to promote independence in preparation for the transition into Year 1. The use of real-life problems are used to support a deeper understanding of the mathematical concept being taught. Both indoor and outdoor areas have mathematical opportunities, so that children can explore, sort, compare, count and calculate. This ensures we support children to be creative, critical thinkers, problem solvers and to have a go.

KS1 and KS2

In Key Stage 1 (Years 1 and 2), the focus of mathematics teaching is to ensure that pupils develop confidence (along with mental fluency) with whole numbers, counting and place value. Children work with numerals, words and the four operations, including practical resources and pictorial representations to deepen their understanding of the mathematical concept and the relationship between numbers. Children are encouraged to develop their problem solving skills throughout in order to develop a more systematic approach to mathematics. Regular discussions are had about different approaches to solving a problem and the efficiency of that process. Children are encouraged and challenged to use their understanding of number and other concepts to give, explain and justify their reasons behind a given result, supporting assessment of a child's understanding.

In Lower Key Stage 2 (Years 3 and 4), children become increasingly fluent with whole numbers and the four operations, including number facts and the concept of place value. They begin to develop efficient written and mental methods and perform calculations accurately with increasingly large whole numbers. At this stage, children develop their ability to solve a range of problems, including simple fractions and decimal place value. They

are provided with opportunities to develop mathematical reasoning, so they can analyse shapes and their properties and confidently describe the relationships between them. They learn to use measuring instruments with accuracy and make connections between measure and number. Children are encouraged to use both concrete and pictorial representations to deepen their understanding of a new concept as well as support their interpretation of more complex problems and to support their reasoning of results.

In Upper Key Stage 2 (Years 5 and 6), children extend their understanding of the number system and place value to include larger integers. They further develop the connections between multiplication and division with fractions, decimals, percentages and ratio. Children 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. They are introduced to the language of algebra as a means for solving a variety of problems. Teaching in geometry and measures consolidates and extends knowledge developed in number. By the end of Key Stage 2, children should be able to classify and describe shapes with increasingly complex geometric properties using the correct mathematical vocabulary.

Throughout all strands of the maths curriculum, all children are encouraged to 'talk' to explain their mathematical understanding, justify their answers in increasingly difficult real life and 'NRich' problems that encourage children to adapt a systematic approach to solve efficiently. Pupils are also required to explore maths in depth, using mathematical vocabulary to reason and explain their workings.

Maths in the curriculum

- We plan using the National Curriculum.
- We enhance the curriculum using progression grids.
- Subject progression grids are used to develop long term planning.
- Teachers use the long term planning to plan units of work and deliver individual lessons.

This is how we support and ensure access for all children:

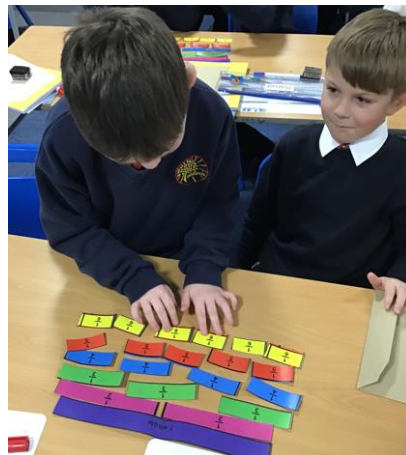
- Ensure that a range of equipment and resources are available to enable success for all pupils (e.g. mathematical manipulatives, additional templates etc).
- We use teacher and self-assessment to quickly identify any child who requires additional support in specific skills

This is how we challenge:

- An additional challenge planned for, from the very start of the lesson

Impact

The successful approach at teaching mathematics at Townlands results in children becoming increasingly efficient in their understanding and application of key mathematical skills and mathematical knowledge. Well planned sequences of learning support children to develop and refine these skills which results in most children reaching their end of year expectations. Children can demonstrate a quick recall of facts and procedures and with increased confidence develop their reasoning skills.



Useful Websites

<https://whiterosemaths.com/>
<https://www.ncetm.org.uk/>
<https://nrich.maths.org/>
<https://classroomsecrets.co.uk/>
<https://www.mymaths.co.uk/>
<https://trockstars.com/>