Holy Trinity Catholic Academy
Boundary Road Newark NG24 4AU

MATHEMATICS POLICY

Date of last review: Updated January 2022
Date of next review: September 2022

Holy Trinity Catholic Voluntary Academy

Mission Statement

“In every child there is a space only God can fill”

St Thomas Aquinas

At our school we continually strive to develop the full potential of the school community in an environment permeated by the Catholic Faith and promoting Gospel values.

At the heart of our mission is the family, school and parish, each supporting and working in mutual co-operation for the benefit of the children.

We are seeking to enrich the lives entrusted to our care through a broad and balanced curriculum designed to meet the needs of each pupil.

The school provides opportunities for young children to develop spiritually, morally, intellectually, physically and emotionally, and share their qualities, abilities and ambitions thus fulfilling individual potential.

As a worshipping community we respect all people and create a loving, caring atmosphere which overflows into an ethos of warmth and welcome towards parents, parish and the local community

Introduction

This policy has been developed in order to ensure that the teaching of Mathematics contributes to the fulfilment of the school's mission:

"In every child there is a place that only God can fill"

As a school, we firmly believe that outstanding Mathematics today will enable our pupils to take their place in the world, creating a successful tomorrow.

The following school policies should be read in conjunction with this one:

- Calculation Policy
- Teaching and Learning Policy
- Curriculum Policy
- Assessment Policy
- Marking Policy
- Special Needs Policy
- Equal Opportunities Policy
- Homework Policy

Rationale

Mathematics equips pupils with the uniquely powerful set of tools to understand and change the world. These tools include the ability to complete calculations with fluency; use their knowledge of fluency to reason logically, and apply their knowledge and understanding to problem solving skills enabling them to think in abstract ways. Mathematics is integral to all aspects of life and with this in mind, we endeavour to ensure that children develop a positive and enthusiastic attitude towards mathematics that will stay with them.

The National Curriculum 2014 for mathematics describes in detail what pupils must learn in each year group. Combined with the Holy Trinity Catholic Academy's Calculation Policy and guidance from the White Rose Scheme of Learning, this ensures continuity and progression and high expectations for attainment in Mathematics.

It is vital that a positive attitude towards mathematics is encouraged amongst all of our pupils in order to foster confidence and achievement in a skill that is essential in our society. At Holy Trinity Catholic Academy, we have adopted a mastery maths approach and use the White Rose Scheme of Learning as the basis of our mathematics programme. We are committed to ensuring that all pupils achieve mastery in the key concepts of mathematics, appropriate for their age group, in order that they make genuine progress and avoid gaps in their understanding that provide barriers to learning as they move through education.

Assessment for Learning, an emphasis on fluency, reasoning, problem solving and the development of mathematical thinking, and a rigorous approach to the development of teacher subject knowledge are therefore essential components of the Holy Trinity Catholic Academy's approach to this subject.

Purpose

"...teachers' knowledge of mathematics for teaching must be like an experienced taxi driver's knowledge of a city, whereby one can get to significant places in a wide variety of ways, flexibly and adaptively."
(Ma, 1999, p. 123)

"Mathematics is a creative and highly inter-connected 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."
(The National Curriculum in England framework document, 2014)

Intent

At Holy Trinity Catholic Academy, our intent is to ensure that we make all of our pupils 'mathematicians'. Our ambition is that all children are well prepared for the next stage of their education and for futures post-18. We aim to provide an ambitious and engaging Mathematics curriculum along with high quality teaching to produce individuals who are resilient, fluent, confident mathematicians, with the ability to recall and apply their knowledge fluently and accurately to a wide range of contexts. It is our intent to provide a stimulating environment and adequate resources so that pupils can develop their mathematical skills to the full.

The national curriculum for mathematics aims to ensure that all pupils:

- 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
- can 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.

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 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 expectation is that the majority of pupils will move through the programmes of study at broadly the same pace with the opportunity for further challenge or support continually available.

As a school, we use the White Rose Scheme of Learning. The following Long Term Plans provide an overview of the Maths Curriculum for Foundation Stage to Year Six:

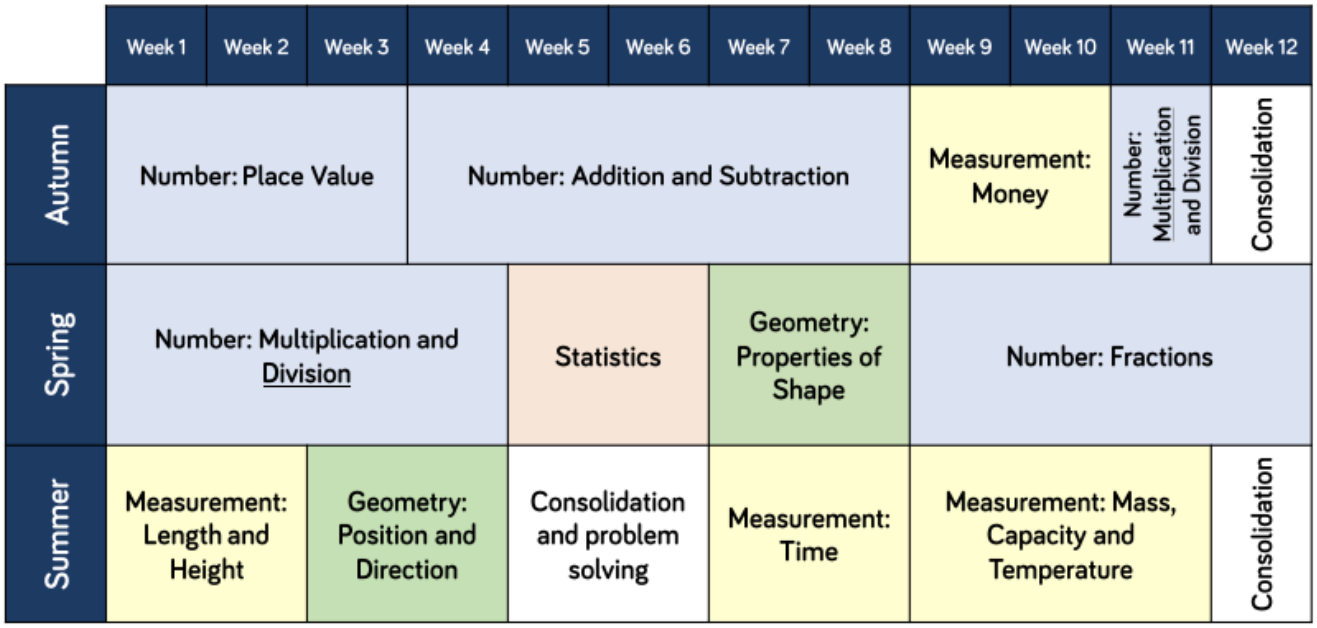
Foundation Stage 2

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	Week 13	Week 14
Autumn	Getting to Know You			Just Like Me!			It's Me 1 2 3!			Light and Dark			Consolidation	
Spring	Alive in 5!			Growing 6, 7, 8			Building 9 and 10			Consolidation				
Summer	To 20 and Beyond			First Then Now			Find My Pattern			On The Move				

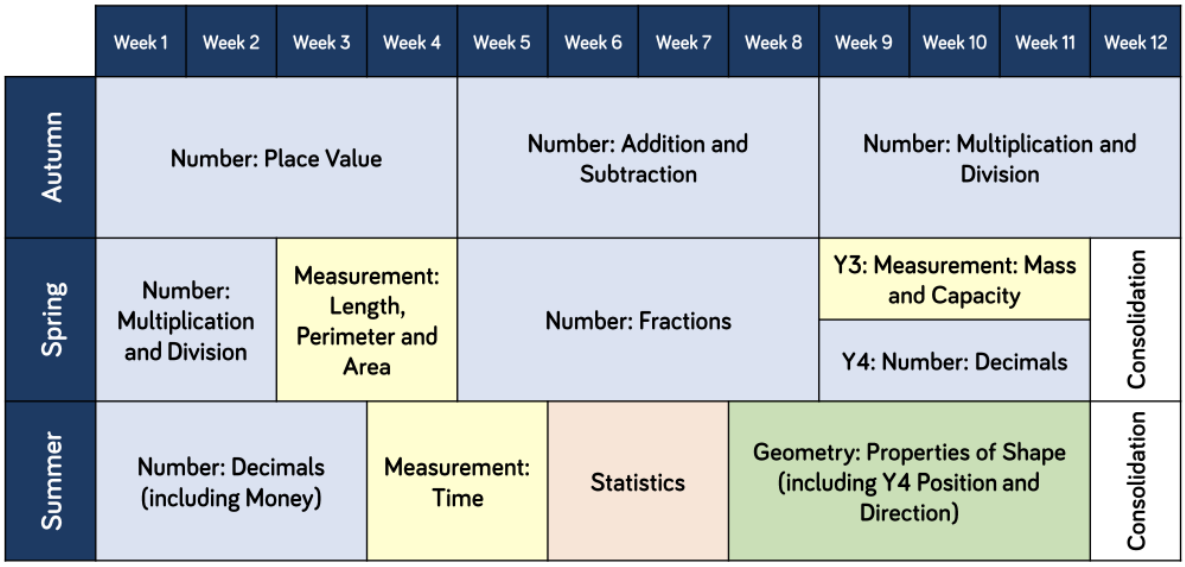
Year 1

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn	Number: Place Value (within 10)				Number: Addition and Subtraction (within 10)					Geometry: Shape	Number: Place Value (within 20)	
Spring	Consolidation	Number: Addition and Subtraction (within 20)			Number: Place Value (within 50)			Measurement: Length and Height		Measurement: Weight and Volume		Consolidation
Summer	Consolidation	Number: Multiplication and Division			Number: Fractions		Geometry: Position and Direction	Number: Place Value (within 100)		Measurement: Money	Measurement: Time	

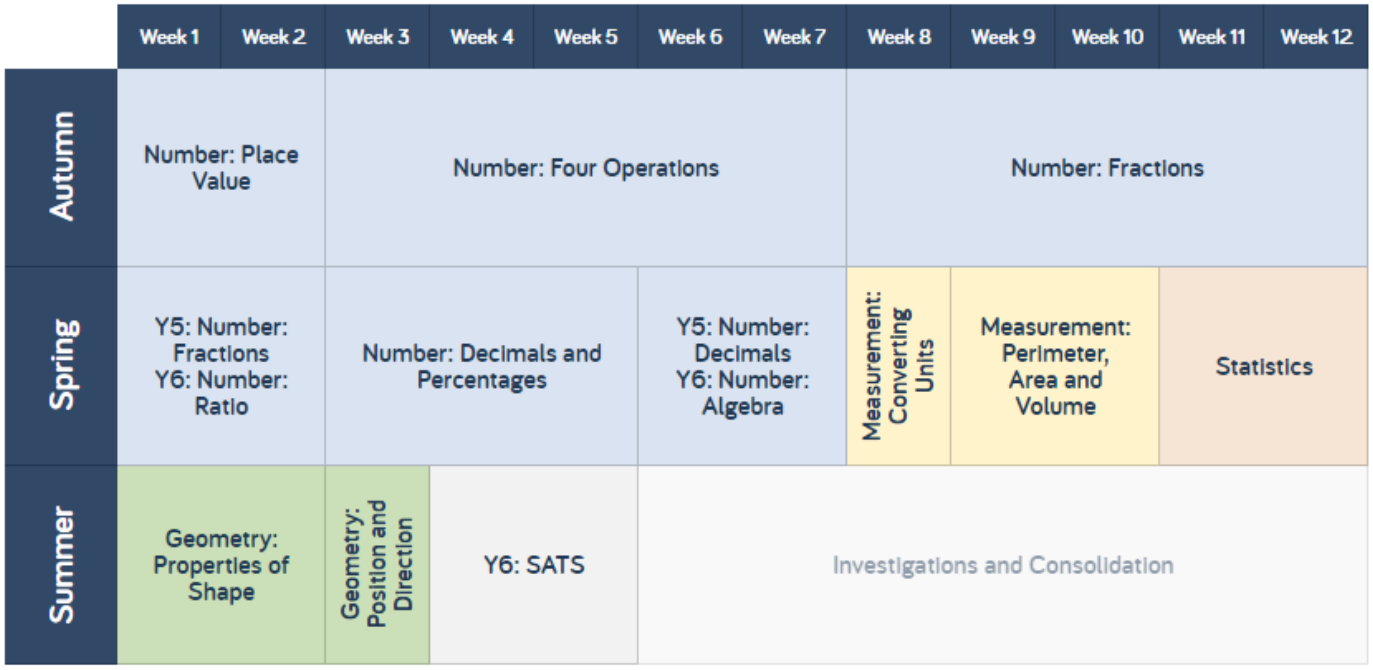
Year 2



Years 3 and 4



Years 5 and 6



Please note that the above overview suggests the order of teaching which may be adapted at the teacher's discretion. Such amendments will be indicated on termly overviews. Staff aim to keep within the suggested weeks but, as a school, we have made the decision that learning should not be moved on too quickly, particularly if concepts have not been embedded; therefore, teachers may not be fully 'on track' with the guidelines above. Please see Maths National Curriculum Progression document.

Implementation

The school works to the expectations set out in the framework document for the National Curriculum in England, 2014 for Years 1 to 6 and the Early Years Foundation Stage Curriculum, 2012. Each year group uses the White Rose scheme of work, which is tailored to meet the individual needs of each cohort and to fulfil our intent for the children by the time they leave us.

Pre-Learning tasks are used at the beginning of a new block of learning. Teachers use these expertly to ensure the immediate next steps for learners are planned for. This ensures that teaching matches all pupils' needs. Within a block of work, marking always informs planning for the next day ensuring that pupils' needs are always planned for. Assessment for learning is used to ensure that children understand each small step before moving onto the next.

At the end of a block, Post-Learning tasks are used to ensure new knowledge and understanding has been retained and can be applied independently. To further support this, Holy Trinity provides pupils with

regular opportunity to apply this knowledge through Daily Active Number sessions. Where learning has not been embedded, these are re-visited in Fluency day / IXL sessions.

The school's Maths Curriculum is implemented with a triple emphasis on Fluency, Reasoning and Problem Solving.

Fluency

Our Maths Curriculum places a strong emphasis on Fluency where we ensure children have a secure understanding of place value and key number facts. We firmly believe that fluency in Maths works through intelligent practice (rather than just mechanical repetition). A key belief shared between all staff is that children must hold Mathematics in their hands before they can hold it in their heads. It is for this reason that a wide range of practical equipment is used in order to develop this conceptual understanding. These manipulatives include: Numicon; Base Ten apparatus, place value counters, counting sticks, number lines and the one hundred square. Manipulatives are used when introducing children to formal written methods to ensure they have a secure understanding of these.

Daily Active Number sessions / Number Sense sessions for Years 1 – 4 and times table/counting activity for Years 5-6, develop fundamental counting skills and quick recall of number facts including multiplication facts. Daily Number Sense sessions for our early years supports our teaching of fluency. Beginning in Foundation Stage, pupils will focus on numbers, visualising them in different contexts along with reasoning and making sense of them. In Years 1 and 2, Number Sense sessions progress to finding addition and subtraction facts without the need for counting.

"When children are number fact fluent, it frees the brain to solve real-world problems more effectively." (Gill 2017)

Opportunity for consolidation of number is provided through KS2 Fluency Day sessions, Active Number and IXL.

Please see **Appendix 1** for an example of Foundation Stage 1 weekly Number Sense overview.

Reasoning

Where fluency is sufficiently developed, all pupils are provided with opportunities to deepen their learning through challenging Reasoning tasks. These tasks develop the children's ability to conjecture, generalise and justify. Pupils will demonstrate clear and succinct reasoning using stem sentences, concrete and pictorial models to support this. Where necessary, the use of stem sentences offers support in effectively communicating in order to develop reasoning for all students.

Problem Solving

To enable pupils to master each unit of Mathematics, the children are encouraged and shown how to apply their knowledge and skills to rich mathematical Problem Solving tasks. Pupils are taught to use systematic ways of working and are encouraged to evaluate the approach taken.

Throughout all aspects, children play with numbers, measures, shapes and patterns to develop numerical awareness and explore the idea of 'proof.'

See also our Calculation Policy.

What does a typical Maths lesson look like at Holy Trinity Catholic Academy?

Lesson outline

All teachers use the same planning format as we strongly believe in consistency. Lessons always begin with Active Number / Number Sense or quick recall of facts for Years 5 and 6. Here, children will practise and develop their knowledge of place value, counting and knowledge of key number facts. Afterwards, a maths retention activity is used to support the retaining of key maths skills including the use of mathematical vocabulary. As highlighted in the National Curriculum, all children must be able to access fluency, reasoning and problem solving so quick whole class reasoning starters are used to enable modelling of such skills making links to prior learning or next steps. This also provides an opportunity to cover any misconceptions or give feedback from the previous lesson. Once learning outcomes have been shared, an opportunity is given for children to see where this maths fits in to any prior learning.

The main body of the lesson is then taught using the 'My turn, your turn' approach. Challenge is given throughout this time with opportunities to deepen understanding. Once children have taken part in the modelling element they will move to independent, group or partner work to consolidate and develop the skills. Some children may need further modelling or support in order to become independent.

Each lesson finishes with a Plenary. This will involve work with the whole class, or within groups, to review steps to success, identify misconceptions, to discuss next steps or class feedback.

The teaching of arithmetic always follows the Holy Trinity's Calculation Policy, which gives an overview of the development of addition, subtraction, multiplication and division from Reception to Year 6. Teachers are expected to use this detailed information on progression through each strand and follow the guidance of using practical resources and models to develop understanding at each stage.

Weekly homework supports the weekly Maths unit through use of IXL. Teachers use homework to assess each child's understanding within that area of work.

See also our Calculation Policy and Homework Policy.

Provision

Pupils are provided with a variety of opportunities to develop and extend their Mathematical skills, including:

- Group work
- Paired work (including Talk Partners)
- Whole class teaching
- Individual work

Pupils engage in:

- the development of mental strategies
- written methods
- practical work
- investigational work
- problem solving
- mathematical discussion
- consolidation of basic skills and number facts
- maths games and puzzles

Mathematics contributes to many subjects and it is important the children are given opportunities to apply and use Mathematics in real contexts. It is important that time is found in other subjects for pupils to develop their Mathematical skills, e.g. there should be regular, carefully planned opportunities for measuring in science and technology, for the consideration of properties of shape and geometric patterns in technology and art, and for the collection and presentation of data in history and geography. We endeavour at all times to set work that is challenging, motivating and encourages the pupils to think about how they learn and to talk about what they have been learning. Additional enrichment opportunities are provided for pupils to further develop mathematical thinking e.g. through cooking, music, and maths investigations and games.

To provide adequate time for developing mathematics, maths is taught daily and discretely. Maths lessons may vary in length but will usually last for about 50 minutes in Key Stage 1 and 60 minutes in Key Stage 2.

Inclusion

The following principles inform and guide our policy and practise:

- meeting the diverse and complex needs of each and every individual is embedded in everything that we do as a whole staff;
- it is the responsibility of the school to enable the child to access and make progress through the curriculum;
- equal opportunities is not the same as equal provision.

Above all, we celebrate and affirm the diversity in our school, our community, our society and our world and commit ourselves to enabling all our pupils to participate constructively as they grow.

For every child to be able to participate in the daily Mathematics lesson, we must know each of them as individuals. For children with SEND, teaching must be closely linked to their IEP targets. What is good provision for a child with SEND is good for all children i.e. an abundance of activities that allow children to learn visually, through speaking and listening and kinaesthetically.

We respond to children's diverse learning needs by:

- creating effective learning environments;
- securing their motivation and concentration;
- providing equality of opportunity through a range of teaching approaches and modifying these for individual needs;
- using appropriate assessments
- setting targets for learning;
- ensuring that every child make at least consistently strong progress because their learning is differentiated and precisely matched to their learning needs.

See also our Inclusion policy.

Resources

At Holy Trinity Catholic Academy, we know that children become fluent in mathematics when they have lots of 'hands on' experiences. Therefore, children and staff draw on a wide range of practical resources in order to develop the conceptual understanding of maths - its structures and its relationships. This then helps children move smoothly to abstract representations and recorded methods. Good use of resources also helps make the learning more interesting. In every class from Year 1 to Year 4, children have access to a 'Maths Box'. This allows them to choose and use a resource independently if they feel it would support them in carrying out a task. Further resources relating to key whole school topics, for example 'Measurement' are kept in the Mathematics Resource Cupboard. We believe that by providing consistent resources across school, pupils will build on their mathematical knowledge and understanding with greater confidence.

Information and Communication Technology

ICT is used in various ways to support teaching and motivate children's learning. Each classroom has an interactive whiteboard. All teachers are provided with a laptop to support their planning and provision, and are encouraged to use ICT to enhance teaching and learning in mathematics where appropriate. The school subscribes to 'Timestables Rockstars' to facilitate further practise of key skills online and at home.

Impact

The impact of a block of work can be measured from Pre-Learning to Post-Learning tasks.

Assessment for learning occurs throughout Maths lessons and is acted upon with immediate effect.

At the end of each term, children sit assessment tests, based on that term's learning. Assessment information is then obtained from the tests and is used to dictate provision and set targets. These assessment tests also inform teacher's assessments of pupils' attainment and progress and are analysed by the SLT, and used to inform target-setting.

In Year 2 and Year 6, Standardised Assessment Tests (SATs) are completed by children. These tests are national and the results are used to measure a school's performance in Mathematics compared with schools locally and nationally. Children are expected to be competent in arithmetic and must be able to reason. In Key Stage 1, pupils complete two Mathematics test papers: Paper 1: Arithmetic and Paper 2: Reasoning. In Key Stage 2, pupils complete three Mathematics test papers: Paper 1: Arithmetic, Paper 2 & 3, Reasoning.

Continuing Professional Development (CDP)

Leaders and Governors at Holy Trinity believe that outstanding teaching is underpinned by providing staff with regular professional development opportunities to ensure their expertise and subject knowledge is always developed and kept contemporary. Regular professional development is always identified by the Senior Leadership Team and Maths subject leader as part of the subject's development plan. Clear and precise professional development, from a range of sources, will ensure:

- the mathematics curriculum is delivered thoroughly and consistently;
- staff subject knowledge is enhanced and up-to-date;
- teachers are confident with using a range of practical and electronic resources to support the teaching and learning of abstract concepts.
- Assessment for Learning is consistently strong and is used accurately to identify each child's next step in learning.

See also our Teaching and Learning policy.

APPENDIX 1

F1 Number Sense plan
(using numbers to 5 initially and progressing to numbers to 10 by the Summer term)

Session 1	Session 2	Session 3	Session 4	Session 5
Counting aloud, around the circle, body counting. Subitising - show the children a number of objects - can they identify how many without counting initially? Show an image (eg. spots on a dice) - can they identify the number? How do they know? Prove it.	Five frames - making numbers in different ways.	Part part whole models - making numbers in different ways by placing objects/ counters.	Comparing amounts - who has more/fewer. How do you know?	Sorting counting objects by different criteria. Can you spot my pattern? How have I sorted?