**Mission Statement Motto**: *Building relationships with God and each other, working hard in faith and hope to give our best in all things*

# Holy Cross Catholic Primary School

# MATHEMATICS POLICY

**Policy written: Autumn 2014**
**Policy review: Spring 2017, Summer 2018 & 2019, Spring 21, Spring 23**
**Review date: Spring 2025**

**Core Values:** *Respect, Honesty, Tolerance, Justice, Forgiveness*

**HOLY CROSS CATHOLIC PRIMARY SCHOOL**

**Mathematics Policy**

**Mission Statement**
Holy Cross is a Catholic school which seeks to build a closer partnership with parents, Parish and the wider community.

We work hard to provide an environment which is secure, stimulating and happy and where everyone is appreciated and enabled to give of their best.

We encourage all to have respect for each individual, to be honest, tolerant, just and forgiving and to develop a closer relationship with each other and through this, a closer relationship with God.

We recognise Jean Baptiste Debrabant's vision that: "A Christian based education is a sure hope for the future of religion and society."

**Rationale**
Mathematics is a tool that all people need in their day-to-day lives. Without a sound understanding of numbers and their many and varied applications, large areas of adult life will be closed or incomprehensible. As well as a life skill, mathematics is also a useful language, a worldwide system of communication. It has its special signs, symbols and patterns. Mathematics builds logical thinking and trains children to solve problems that they come across. It can give enjoyment to many people as they handle numbers and concepts easily, or see patterns. Mathematics is a unique way of viewing and making sense of our world.

**Aims**
At Holy Cross School we regard it as essential that our children enjoy their mathematics work and gain a sense of achievement at all levels. We aim to give our children opportunities to:

- develop a sound understanding of basic mathematical concepts through interactive whole class teaching and suitably differentiated activities (for SEN chidren).
- Have 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, following the updated 'Calculation Policy'
- Make sense of number problems and recognise the operations needed to solve them, using methods such as bar modelling or part part whole.
- Demonstrate their skills and be able to explain their methods and reasoning using the 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.
- Acquire appropriate and necessary mathematical skills and be able to apply them confidently and accurately across the curriculum
- Logically apply their mathematical knowledge to solve problems using estimation and questioning
- Use mathematics as part of their everyday life in school and at home, and to understand its relevance.

**Objectives**

At Holy Cross School we will provide the children with a variety of opportunities that will:

- Ensure that all pupils follow a broad and balanced mathematics programme based on the New Primary Maths Curriculum
- Ensure that all pupils are provided with interesting and challenging tasks that enable them to achieve standards commensurate with their abilities and potential
- Ensure that pupils can work individually, collaboratively in groups and within the whole class
- Allow pupils to develop as independent learners, able to make decisions about their own work.

**Principles of Teaching and Learning**

Our teaching and learning strategy is based on the revised National Curriculum for Mathematics (2014) along with the Curriculum Guidance for the Early Years Foundation Stage underpinning teaching in the Early Year Foundation Stage. We recognise the importance of establishing a secure foundation in mental calculation and recall of number facts before standard written methods are introduced. We use accurate mathematical vocabulary in our teaching and children are expected to use it in their verbal and written explanations.

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 Numeracy Skills, e.g. there should be regular, carefully planned opportunities for measuring in science, for the consideration of properties of shape and geometric patterns in technology and art, and for the collection and presentation of data in science, history and geography.

We endeavour at all times to set work that is challenging, motivating and encourages our children 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.

At Holy Cross School we recognise that children learn in many different ways. Throughout their time in the school children will have opportunities to:

- share class teaching that is purposeful and interactive
- take part in frequent mathematical discussions and investigational work
- work in groups discussing ideas and solving problems
- practice basic number work at their own level using a variety of materials
- choose their own ways of solving problems and their own materials to do so
- have their ideas and ways of working valued and celebrated
- learn the value of "working out" and of showing their working using jotting boxes
- learn to present all mathematics work clearly and show answers to problems
- use computing as a part of their mathematics learning
- opportunities to consolidate their basic skills and number facts
- play Maths games

Our teaching must always reflect the needs of our pupils. Interactive whole class teaching should be lively and well-paced, using questions and demanding thinking skills.

Maths is taught daily (approximately one hour at Key Stage 2 and 45 minutes in Key Stage 1). Each lesson has learning objectives that is shared with the children. The success criteria should be revisited at the end of a lesson so pupils are aware of their learning. The length of the teaching time may vary according to where the class is in a mathematical topic but should always enable participation by children of all abilities. Every lesson will include a mental/oral task and mini plenaries throughout the lesson where required as well as journaling questions as the teacher sees fit. Children should adhere to the Maths presentation creed and journaling sentence starters in their books at all times.

Mathematics is developed throughout the Early Years Foundation Stage Profile. Nursery and Reception follow the 'Early years' curriculum with assessment criteria taken from the 'Development Matters' document. White Rose and Mastering Number will be used to support teacher planning.

**MASTERY**

From 2018 Holy Cross School will be developing and embedding a curriculum for mastery. Mastery means having a secure understanding of mathematical concepts and processes, combined with a genuine procedural fluency. A child who has mastered a particular skill is able to apply their understanding and solve different types of problem, including where the skill is either embedded in a different context, or where a choice of method has to be made. For example, a child who has mastered adding two 2-digit numbers should be able to identify where this is required, even when it is not presented in a straightforward way (e.g. ☐ - 23 = 39) and also choose an efficient strategy for doing it (e.g. 40 + 22).

Some children will be able to achieve mastery with greater depth. This means that they are able to apply their understanding of a concept in a wider variety of contexts, some of which are more difficult. They can manipulate the facts they know and the skills they possess in order to solve more complex problems. More developed forms of mathematical reasoning are central to this process, and enable the recognition of a link between operations and processes. For example, a child who has mastered the addition of 2-digit numbers in greater depth will be able to explain why it is possible to add two numbers both with units digits greater than 5 and get answers with units digits less than 5 (e.g. 16 + 7 = 23). They

may also understand why adding a number to its matching reverse (46 and 64) will always give a multiple of eleven.

**Mastery i**nvolves the development of three forms of knowledge:
**1.** Factual – I know that…..
2. Procedural – I know how…..
3. Conceptual – I know why …..

**Key elements of maths mastery lessons:**

- Understanding not doing
- Whole class teaching
- Small steps
- Intelligent practice – variation not variety
- Concrete – Pictorial – Abstract
- Precise use of mathematical language
- Speaking in full sentences
- Opportunities for children to go deeper (greater depth) *throughout learning sequence*

**Common features of mastery include:**

- An expectation that all children can succeed in maths, often achieved by keeping the class together
- **Deep** and sustained learning
- The ability to build on something that has already been sufficiently mastered: Children who master a concept easily are expected to deepen their understanding, for example by applying it to solve problems embedded in mathematical investigations or more complex contexts
- The ability to reason about a concept and make connections
- Conceptual and procedural fluency: Ensuring children are fluent in mathematical procedures and number facts by rehearsing these in systematic ways
- Achievable for all: Children who do not master an objective with the rest of the class should be supported to enable them to gain more experience and achieve mastery, for example through same-day intervention, plus longer-term help if necessary.

**<u>Teaching strategies to support mastery</u>**

- Discussion – the answer is only the beginning
- Ping-Pong style – providing sufficient scaffold for all pupils to access
- Repetition and chorusing
- Precision in the use of mathematical language
- Carefully chosen examples and representations to draw out the essence of the concept (conceptual variation)
- Intelligent practice (often outside of the lesson)

One of the principles of teaching for mastery is that every child can succeed in maths, and that the majority of children in the class should move at the same pace. In practice, this means that children who have mastered concepts or skills quickly should be challenged through activities and investigations that deepen their understanding of that idea, rather than moving on to new content.

Children who do not master a concept as quickly as the rest of the class should be supported to enable them to keep up. An effective way of doing this is through same day intervention, which helps children who need more time and support in order to achieve mastery.

**Times Tables**

Times Tables are at the heart of mental arithmetic, which in itself helps forms the basis of a child's understanding and ability when working with number. Once the children have learnt their times tables by heart, they are then able to work far more confidently- and efficiently- through a wide range of more advanced calculations. At Holy Cross Catholic Primary School, we believe that through a variety of interactive, visual, engaging and rote learning techniques, all children can achieve the full times table knowledge by the time they enter Year 4.
In order to help ensure this happens, we have agreed to subscribe to Time Tables Rockstars where children can practise their timetables, complete competitions and beat their scores.
Children can also work towards receiving their timetables certificates.

**KIRFs (Key Instant Recall Facts)**

To develop your child's fluency and mental maths skills, we have decided to introduce **KIRFs (Key Instant Recall Facts)** throughout school**. KIRFS are a way of helping your child to learn by heart, key facts and information which they need to have instant recall of.**

KIRFs are designed to support the development of mental maths skills that underpin much of the maths work in schools. They are particularly useful when calculating: adding; subtracting; multiplying or dividing. They contain number facts such as number bonds and times tables that need constant practice and rehearsal, so children can recall them quickly and accurately.
Instant recall of facts helps enormously with mental agility within maths lessons. When children move onto written calculations, knowing these key facts is very beneficial. For your child to become more efficient in recalling them easily, they need to be practised frequently and for short periods of time.
Each half term, children will focus on a Key Instant Recall Fact (KIRF) to practise and learn at home for the half term. They will also be available on our school website under the maths section. The KIRFs include practical ideas to assist your child in grasping the key facts and contain helpful suggestions of ways in which you could make this learning interesting and relevant. They are not designed to be a time-consuming task and can be practiced anywhere – in the car, walking to school, etc. Regular practice - little and often – helps children to retain these facts and keep their skills sharp. **Throughout the half term, the KIRFs will also be practiced in school and your child's teacher will assess whether they have been retained.**
Over their time at primary school, we believe that - if the KIRFs are developed fully - children will be more confident with number work, understand its relevance, and be able to access the curriculum much more easily. They will be able to apply what they have learned to a wide range of problems that confront us regularly.

## CPD

All staff will receive annual in school training in Maths. The focus of this training will be to develop staff's own subject knowledge and understanding of the pedagogy about the teachings of Maths. Current educational research and good practice in the teaching of Maths will be disseminated regularly to all staff. All staff should be given the opportunity to complete the online training Modules form the NCTEM website. The subject leader will attend termly the Thurrock Primary Maths Network meetings and be part of the Maths Deanery group.

## Planning

The basis of school planning (Year 1 – Year 6) will be Power Maths and White Rose in EYFS - is a whole-class mastery programme designed to spark curiosity and excitement and help teachers nurture confidence in maths. Power Maths is perfectly aligned to the White Rose Maths progressions and schemes of learning, which we have been using for the past two years. Other resources/schemes such as NCETM website (Teaching Spines), White Rose End of Unit tests Thirds Space Learning (Fluent in 5) as well as teacher choice should be used to support the planning. It is important that fluency, reasoning and problem solving continue to develop throughout the school. Weekly plans should be established based on long term plans which will developed at whole school level.

## Journaling

To meet the expectations of the Primary National Curriculum that "*pupils… must be assisted in making their thinking clear to themselves as well as others…*" *(page 100)* as well as to further improve our percentage of deeper learners, we will introduce 'Journaling' from Autumn 2019. Journal writing in mathematics creates and maintains a focus on thinking within and throughout mathematics lessons because thinking is at the heart of mathematics and communication of thinking deepens understanding and allows for effective assessment.

Reflective 'journal' writing might happen at different times, in different places and for different reasons. The constant is the focus on thinking. Reflections might happen whilst working on some mathematics or thinking about it afterwards. Journaling must be recorded in their orange 'Maths journals'.

Supporting talk and writing in mathematics involves both providing mathematical experiences which are worth talking and writing about and modelling and scaffolding the talk and writing. Teachers will provide prompts, which will indicate to the children that they should attend to their mathematical thinking.

Sentence starters include:

- ✓ I agree/disagree
- ✓ I know that
- ✓ I notice that
- ✓ I think that
- ✓ I wonder if

Examples of sentence starters must be glued in the inside page of their orange books so children can refer to them as and when need.

## Differentiation and SEN

At our school we teach mathematics to all children, whatever their ability. 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 age expected expectations.

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, 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 are identified as having additional needs may also have mathematics targets written into their Pupil Support Plans and Educational Health Care Plans. These targets are reviewed termly. The children will often have support while tackling mathematical tasks. Booster Classes take place during the autumn and spring Terms. The staff at Holy Cross School are committed to inclusion.

More abled children are also addressed through the use of specific targets to ensure that they are challenged at a higher level. Intervention groups take place to ensure the pupils have access to a wide range of higher level activities and challenges. Homework is set in line with the school's homework policy.

**Breadth and Balance**

The curriculum will include a full range of mathematical activities covering all aspects of the subject including number, shape and space and data handling. Using and applying mathematics will be integrated throughout the 'Abacus Active Learn' the chosen scheme of work as lessons include practical, investigative problem-solving and oral activities, as well as the online problem solving activities which are integrated into the weekly planning.

**Variety**

At Holy Cross School our three key principles are:

- regular lessons every day
- emphasis on mental calculations, reasoning and problem solving
- a clear focus on direct, instructional teaching and interactive oral work with the whole class and, where necessary, smaller groups.

**Cross Curricular Links**

Mathematics has strong links to all other curricular areas and will be seen as relevant by children if it is developed in this way. (See Appendix 1)

**Assessment and Reporting**

Assessment is an integral part of the planning, teaching and learning process at Holy Cross School and will be carried out in accordance with the school's Assessment Policy.

All year groups will work on a skills based curriculum, with age related expectations to be achieved by the end of each year/phase.

Within each year group most children will achieve these expectations, some will achieve below them, while others will have moved beyond them in some or all of the objectives. These will be recorded as beginning, within, secure or working at greater depth at age related expectations (ARE).

Informal assessment is carried out by a teacher during mathematics lessons and this is used to inform future planning. Additionally, at the beginning of each unit, teachers create a mind map to assess previous knowledge and record any misconceptions. More summative assessments are carried out as a teacher feels necessary, to measure what children have learnt. White Rose end of block assessments and Power Maths end of unit test are used in Years 1 -6 to quickly identify gaps and provide intervention where necessary. Additionally, children in KS2 complete daily 'Fluent in Five' starters to enhance their arithmetic skills (fluency while Reception and KS1. Half termly assessment is built into the Mathematics Curriculum and children's records are kept from these.

Assessment for Learning is incorporated in mathematics lessons with the use of Learning Objectives, Success criteria and Next Step Marking. Children are encouraged to evaluate their work and progress by responding to their next steps and link this to their targets.

The progress made within the mathematics curriculum by children with Special Educational Needs is reviewed regularly by the class teacher. Teachers will also review progress with the SENCO and raise any concerns whenever necessary. IEP targets will reflect the identified needs of these children.

The children's work is marked in accordance with the school's Marking policy.

Children will continue to be assessed at the end of KS1 and KS2 through SATs testing and teacher assessment. The Early Years Profile in the Reception Class enables teachers to assess children's mathematical understanding in the Foundation Stage. Written observations along with photographical evidence are recorded online on Target Tracker. In years 1 (Summer 2), 3, 4 & 5 children will be assessed against age related expectations. Mathematics records, teacher assessments and test results are sent on to the next teacher and continue with the child through the school.

Two open evenings are held, one in the Autumn Term and one in the Spring Term to report children's progress and achievements to parents/guardians and a 'Grade Card' is sent home. An annual full written report is sent home in the Summer Term. Parents have the opportunity to attend an optional open evening to discuss their child's school report.

**Equal Opportunities**

Throughout children's mathematical experiences we aim to ensure equality of opportunity for them, in line with the school's Equal Opportunities policy. All children will feel valued and that their contribution is as important as anyone else's. All successes will be celebrated and staff will always be sensitive to issues of gender or cultural diversity.

**Spiritual, Moral, Social and Cultural Development**

Aspects of spiritual moral, social and cultural development will arise during mathematics teaching, particularly during collaborative work where listening to others, sharing and accepting other's ideas are so important. Caring for resources and taking responsibility for their actions are issues that will also

arise**.** All staff at Holy Cross Primary School will emphasise these and help children to develop an honest, sharing, caring attitude to others valuing themselves, others and the materials they are using.

**Staffing and Resources**
The development of mathematics within a year group is the responsibility of the class teacher with the help, advice and support of the mathematics coordinator. The Head teacher has the overall responsibility for curriculum development. Where relevant, support staff are deployed to work with children under the direction of the class teacher.

Teachers use a range of practical resources to teach mathematics, visualisers are used to display work for groups and enable the teacher to share good examples of work.

Classrooms are stocked with basic mathematics equipment and there is a central resource cupboard.

**Mathematics and Computing**
There is a strong link between these two subjects and this will be continually developed throughout the children's time at Holy Cross Primary School. The children's computing capability will be developed through a variety of software packages and computing tools.

**Health and Safety**
All staff at Holy Cross School are aware of Health and Safety within their classrooms and around the school and need to ensure that all mathematics equipment is used in a safe and sensible manner. Children should be aware of their own responsibilities in their area and also if they are working outside of the classroom.

**Community Links and Extra Curricular Activities**
At Holy Cross School we know that the partnership between home and school is vital to a child's mathematical learning. Children will often be asked to do mathematical work at work at home in accordance with the school's homework policy. This will support or further classroom work. The help given by parents and friends within the school is greatly valued. Some mathematics activities take place as visits outside the school and in the local area.

The school is involved in a Mathematics hub involving local schools to share good practice and keep up to date with changes to the math's curriculum.

Governors are informed termly via the Head Teacher's report about developments and achievements in Math's and parents are informed via newsletters, parents maths workshops, the prospectus and the website.

**Role of the Coordinator**
The Mathematics Coordinator will

- take the lead in policy development
- support colleagues in their implementation of the mastery curriculum through Power Maths, NCETM Spines and White Rose.
- monitor delivery of the new mathematics curriculum
- take responsibility for the organisation and purchase of resources for mathematics

- disseminate appropriate mathematical information to colleagues and parents.

**Policy Review**

Policy written Autumn 2015
Reviewed Spring 2017, Summer 2018 & Summer 2019, Spring 2021, Spring 2023 with amendments
Policy review 2025

**APPENDIX 1**
**CROSS-CURRICULAR MAPPING OF MATHEMATICS**

**ENGLISH** reading mathematics instructions
writing about mathematics
using the technical language of mathematics

**SCIENCE** quantitative measurement within investigations
data-handling both sorting and presentation by diagram or graph
calculations in measurement
aspects of shape and space e.g. descriptions, constructions, measurement

**TECHNOLOGY**
using shape and space and measurement when making things

**GEOGRAPHY**
location within shape and space for maps
measurement for maps
understanding scale
time scale in environmental changes
data-handling

**HISTORY** the passing of time and the use of calendars
understanding the large numbers involved in dates
data-handling

**P.E.** algebra patterns of movement sequences in gymnastics and dance
direction, angle, length, 2D shape names
shape and space in movement of any kind and the use of rotations, reflections etc.
computing scores for games

**MUSIC** looking at instruments for shape, pattern, order of size
listening to music and recognising long and short sounds, long and short pieces, slow and fast pieces

composing music using numerical patterns in rhythm, rising and falling patterns in melodies, patterns of intervals in chords and harmonies, patterns in sequences e.g. minuet form, symphony form

**ART**

pattern in design
number in accurate drawing
position in accurate drawing
scale and proportion
understanding shape and space in 2D and 3D work
understanding the concept of area by printing and collage work

**Computing**

spreadsheets
co-ordinates
control & monitoring
shape
Computer Programming