

'The Magic of Maths'

Mathematics



Holy Family Catholic Primary School

Our Vision

Holy Family we believe that Mathematics is a tool for everyday life. It is a whole network of concepts and relationships which provide a way of viewing and making sense of the world. It is used to analyse and communicate information and ideas and to tackle a range of practical tasks and real life problems. It also provides the materials and means for creating new imaginative worlds to explore.

Key Features of our Mathematics Curriculum

Using the Programmes of Study from the National Curriculum for Mathematics we aim to develop:

- An enjoyment and curiosity of mathematics and for children to feel confident to become successful;
- Children's abilities to use and apply mathematics to solve problems in both the classroom and in 'real life' contexts;
- A confidence to communicate ideas in written form and orally;
- Independent and collaborative ways of working, encouraging children to share ideas and solve problems together;
- A wide range of mathematical vocabulary to be modelled and used in the classroom environment;
- The children's ability to recall mental facts accurately and quickly and using effective written calculation methods;
- Children's logical thinking, reasoning and ability to problem solve as transferable life skills.

At Holy Family, our children learn important concepts and can make connections within mathematics. They develop a range of skills in using and applying mathematics. They are able to work independently and cooperatively and take the initiative in solving problems. Children think for themselves and are willing to try when faced with challenges. They love to learn from mistakes and false starts.

When investigating mathematically, most of our children are able to reason, generalise and make sense of solutions. They are generally fluent in performing written and mental calculations and mathematical techniques. They use mathematical language and symbols accurately in their work and in discussing their work with others.

Most importantly children at Holy Family enjoy the subject and develop a lifelong love of mathematics!

“In our maths lessons we don’t just answer questions- We explore, find out new things and have lots of fun!”

Year 6 Child - March 2020

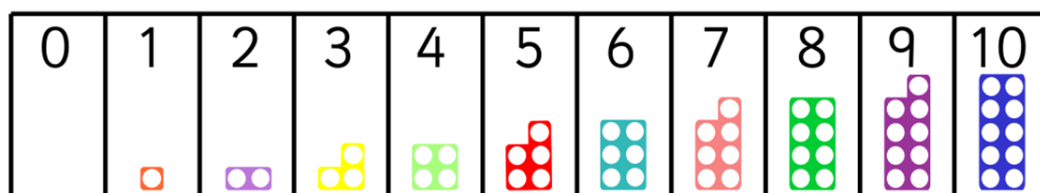
Mathematical Language

At Holy Family, we understand that mathematical language is crucial to children’s mathematical thinking. So we introduce new words from the curriculum in a suitable context, with relevant real objects, mathematical apparatus, pictures and/or diagrams, explaining their meanings carefully. In lessons, talk partners are used to get children using mathematical vocabulary, providing the opportunity for every child to engage in mathematical discussion. Key vocabulary used in a topic is displayed on the Maths working walls.

Asking closed questions limits the scope of a pupil’s response to a correct or incorrect answer and deprives them of the opportunity to talk through their thinking. By using open questions we encourage children to explain the steps they have made and make use of any new maths vocabulary they have learnt. It can be helpful to develop a bank of effective questions to refer back to at any time in lessons.

Manipulatives

A manipulative is a physical object that children or teachers can touch and move which is used to support the teaching and learning of mathematics. In our lessons **Numicon**, **Cuisenaire rods** and **Dienes blocks**, along with other apparatus are used regularly to support children to engage with mathematical ideas.



Mathematical Knowledge

Maths planning begins in every Year Group (Y1-6) with Long Term Plans for the year, broken down into terms. We use the White Rose Maths Hub long term plans. From the Long Term Plan, teachers follow the mathematics content. The sequence of learning is important and is always maintained. Within the Long Term Plan, statistics and elements of measure are often taught through Science and the Creative Theme. Once the appropriate content is selected, planning is guided by the National Curriculum and its objectives. Teachers begin with the 2014 objectives and use White Rose Maths Schemes of learning to support planning.

Each half term your child will be learning about 2 or 3 topics in mathematics and the topics covered are outlined in the curriculum newsletters. Within these topics, children are given opportunities to make connections between different mathematical facts, procedures, and concepts to create a rich network.

Quick retrieval of number facts is important for success in mathematics. It is likely that children who have problems retrieving addition, subtraction, multiplication, and division facts, including number bonds and multiples, will have difficulty understanding and using mathematical concepts they encounter later on in their lessons. At Holy Family, we ensure that children are given ample opportunities to develop fluent recall of number facts.

'Staff give a renewed focus to pupils learning their multiplication tables as soon as possible.' OFSTED 2017

Key instant Recall facts (KIRFs) are sent home each half term. They should be learnt in school and practiced at home.

Key Instant Recall Facts (KIRF's)



By the end of each half term, children should know the following facts. The aim is for them to recall these facts instantly.

| | Reception | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
|-------|----------------------------------------------------|----------------------------------------------------|----------------------------------------------------------------------|---------------------------------------------------------------------|-----------------------------------------------------------------------------|------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Aut 1 | Recite the number names in order to 10 and beyond. | Recite the number names in order to 50 and beyond. | I know number bonds to 20. | I know number bonds for all numbers to 20. | I know number bonds to 100. | I know decimal number bonds to 1 and 10. | I know the multiplication and division facts for all times tables up to 12×12 . |
| Aut 2 | Begin to know the days of the week. | I know number bonds for each number to 6. | I know the multiplication and division facts for the 2 times table. | I know the multiplication and division facts for the 3 times table. | I know the multiplication and division facts for the 6 times table. | I know the multiplication and division facts for all times tables up to 12×12 . | I can identify common factors of a pair of numbers. |
| Spc 1 | Recognise numerals 0-10 | I know doubles and halves of numbers to 10. | I know doubles and halves of numbers to 20. | I can recall facts about durations of time. | I know the multiplication and division facts for the 9 and 11 times tables. | I can recall metric conversions. | I can convert between decimals, fractions and percentages. |
| Spc 2 | Be able to partition numbers to 5 into two groups. | I know number bonds to 10. | I know the multiplication and division facts for the 10 times table. | I know the multiplication and division facts for the 4 times table. | I can recognise decimal equivalents of fractions. | I can identify prime numbers up to 20. | I can identify prime numbers up to 50. |
| Sum 1 | Count in 10s to 100 | I can tell the time. | I can tell the time. | I can tell the time. | I know the multiplication and division facts for the 7 times table. | I can recall square numbers up to 122 and their square roots. | Know the decimal and percentage equivalents of the fractions $\frac{1}{2}$, $\frac{1}{4}$, $\frac{3}{4}$, $\frac{1}{5}$, $\frac{2}{5}$, tenths and fifths |
| Sum 2 | Count in 2s to 20. | I know number bonds for each number to 10 | I know the multiplication and division facts for the 5 times table. | I know the multiplication and division facts for the 8 times table. | I can multiply and divide single-digit numbers by 10 and 100. | I can find factor pairs of a number. | Know the square roots of square numbers to 15×15 |

The **calculation policy** shows the methods we teach to solve addition, subtraction, multiplication and division problems and the progression across the school. At Holy Family, children are taught a range of mental and pencil-and-paper methods, and encouraged to consider when different methods are appropriate and efficient.

Pitch, Pace and Challenge

At Holy Family, the expectation is that the majority of children will move through the topics at broadly the same pace. However, decisions about when to progress will always be based on the security of children's understanding and their readiness to progress to the next stage. Children who grasp concepts rapidly will be challenged through being offered rich and sophisticated problems before any acceleration through new content. Those who are not sufficiently fluent with earlier material will consolidate their understanding, including additional practice, before moving on.

'Staff provide well-pitched challenges to pupils to help them to master concepts in mathematics.' OFSTED 2017

'Pupils told me they love mathematics, that the complexity of problems makes them think hard and that they know how to aim high in their learning.' OFSTED 2017

Solving Problems

Problem solving generally refers to situations in which children do not have a readily-available method that they can use. Instead, they have to approach the problem flexibly and work out a solution for themselves.

At Holy Family we teach a variety of problem-solving strategies which enable them to make sense of unfamiliar situations and tackle them intelligently.

'Pupils have many opportunities for reasoning and problem-solving.' - OFSTED 2017

Bar modelling is used to help children understand a problem. Bar models are pictorial representations of problems or concepts that can be used for any of the operations: addition, subtraction, multiplication and division. In word problems, bar models hold the huge benefit of helping children decide which operations to use or visualise problems.

While working on a problem, children are encouraged to ask questions like, 'What am I trying to work out?', 'How am I going about it?', 'Is the approach that I'm taking working?', and 'What other approaches could I try?' When the problem is completed, encourage children to ask questions like, 'What worked well when solving this problem?', 'What didn't work well?', 'What other problems could be solved by a similar approach?', and 'What similar problems to this one have I solved in the past?' Children should communicate their thinking verbally and in writing—using representations, expressions, and equations—to both teachers and other children.

Assessment

Assessment is not just used to track children's learning but also provides teachers with up-to-date and accurate information about the specifics of what children do and do not know. This information allows teachers to adapt their teaching so it builds on children's existing knowledge, addresses their weaknesses, and focuses on the next steps that they need in order to make progress.

'School information indicates that current pupils, for example those in Year 6, make good progress in mathematics.' OFSTED 2017

At Holy Family, assessment in Maths is continuous. From the beginning of every lesson, teachers and teaching assistants will be assessing what their children are, or are not understanding and use this to scaffold each segment of the lesson. Interventions will be both planned for and 'live', meaning that misconceptions are dealt with immediately and high attaining children are challenged appropriately.

Effective marking and feedback are an important element of teachers' responses children's learning. This may be given either orally or in written format but is always:

- **specific, accurate, and clear** (for example, ‘You are now factorising numbers efficiently, by taking out larger factors earlier on’, rather than, ‘Your factorising is getting better’);
- **given feedback sparingly so that it is meaningful** (for example, ‘One of the angles you calculated in this problem is incorrect—can you find which one and correct it?’);
- **compares what a pupil is doing right now with what they have done wrong before** (for example, ‘Your rounding of your final answers is much more accurate than it used to be’);
- **encourages and supports further effort** by helping children identify things that are hard and require extra attention (for example, ‘You need to put extra effort into checking that your final answer makes sense and is a reasonable size’);
- **provides guidance to children on how to respond to teachers’ comments** and give them time to do so; and
- **provides specific guidance on how to improve** rather than just telling children when they are incorrect (for example, ‘When you are unsure about adding and subtracting numbers, try placing them on a number line’, rather than ‘Your answer should be -3 not 3’).

Motivation

At Holy Family, we model positive attitudes towards mathematics throughout the whole school. We encourage and model motivation, confidence, and enjoyment in maths for all children.

We engage parents/ carers to encourage their children to value, and develop confidence in mathematics.

‘Parents commented very positively about the impact of the school’s teaching of mathematics on their children.’ - OFSTED 2017

Maths at Holy Family is going from strength to strength.

“The sky is where magic and mathematics become one.”

-Tony Abbott