Train up a child in the way they should go; even when they are old they will not depart from it. Proverbs 22:6

Subject Information: Mathematics

Fluency

How will I solve…?

Within a caring Christian environment, we will;

- **inspire confident learners who will thrive in an ever-changing world.**

Patterns and relationships

Why does it work?

Making connections

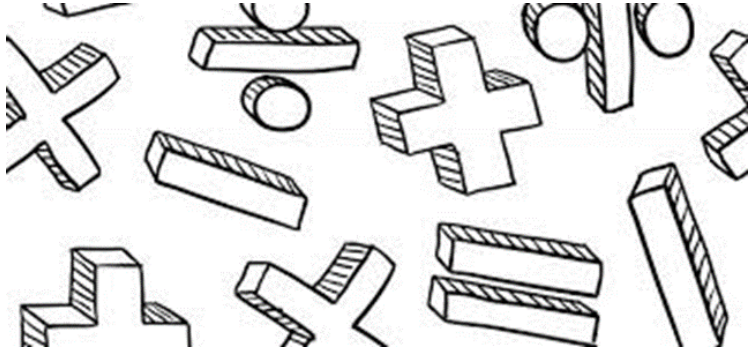
Prove it!

Always, sometimes, never?

Principles of mathematics at St Chad's C of E (VC) First School

At St Chad's C of E (VC) First School, Maths is:

- Fun and engaging.
- Meaningful - using practical equipment and real life situations.
- An opportunity to take risks in problem solving and reasoning.
- Developing fluency facts.
- Rewarding – mastering new strategies and refining skills.



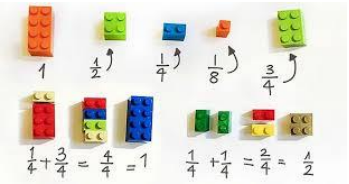
What is Maths?

Maths is a core subjects in the primary curriculum and 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.

In the Early Years, mathematics is a specific area of learning and it is split into two early Learning Goals: Number and Numerical Patterns. In order to be at the expected level of development at the end of Reception children will need to have met the Early Learning Goals in Number and Numerical Patterns.

How is Mathematics taught?

Mathematics is taught daily in school and in Years 1-4 totalling of 5 hours per week. In Reception a mathematical focus is taught each day with adult led tasks or choose provision available each week The skills taught in maths are also used cross curricular, in subjects such as science and geography. A typical lesson would involve learners practicing fluency and recall facts to warm up, then being taught a new concept which would be introduced using concrete apparatus and manipulatives. Learners would then be given the time to practice and embed this new learning through independent activities, problem solving and reasoning. Learners are encouraged to talk about the maths they are doing and explain and reason their answer. Learners are always being asked to 'prove it!' when they give an answer. Once learners are confident using manipulatives they move onto representing maths through pictures and finally then into a written calculation – the abstract. This strategy is used no matter what age the learner is, as until they can solve the maths and see what is happening, they will never truly understand the concept. As a school, we follow the Statutory Framework for the Early Years Foundation Stage and the National Curriculum alongside the White Rose Schemes of work, this provides opportunities to learn number facts and to become fluent through a variety of ways (varied fluency) so that they do not just recite number facts but understand them. The White Rose scheme also develops reasoning skills providing our learners with the opportunities to describe and explain their answers.



How will pupils learn?

Pupils will learn through a 'hands-on' approach by investigating and using a range of apparatus, problems and puzzles and fluency based questions, which enables their learning to come to life. Key learning vocabulary is shared and explored with pupils so that they are fluent in demonstrating their learning. To promote a rich partnership in learning between pupils, they will work independently, in pairs, and in small groups; this will enable effective learning discussions to take place and the sharing and modelling of knowledge, understanding and skills.

What will pupils learn?

Pupils will learn the following in each phase:

EYFS	Key Stage 1	Key Stage 2
<u>Number</u> • Have a deep understanding of number to 10, including the composition of each number • Subitise (recognise quantities without counting) up to 5 • Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 (including subtraction facts) and some number bonds to 10, including double facts. <u>Numerical Patterns</u> • Verbally count beyond 20, recognising the pattern of the counting system • Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity • Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally	• The principal focus of mathematics teaching in key stage 1 is to ensure that pupils develop confidence and mental fluency with whole numbers, counting and place value. This should involve working with numerals, words and the four operations, including with practical resources [for example, concrete objects and measuring tools]. At this stage, pupils should develop their ability to recognise, describe, draw, compare and sort different shapes and use the related vocabulary. Teaching should also involve using a range of measures to describe and compare different quantities such as length, mass, capacity/volume, time and money. By the end of year 2, pupils should know the number bonds to 20 and be precise in using and understanding place value. An emphasis on practice at this early stage will aid fluency. Pupils should read and spell mathematical vocabulary, at a level consistent with their increasing word reading and spelling knowledge at key stage 1.	• The principal focus of mathematics teaching in lower key stage 2 is to ensure that pupils become increasingly fluent with whole numbers and the four operations, including number facts and the concept of place value. This should ensure that pupils develop efficient written and mental methods and perform calculations accurately with increasingly large whole numbers. At this stage, pupils should develop their ability to solve a range of problems, including with simple fractions and decimal place value. Teaching should also ensure that pupils draw with increasing accuracy and develop mathematical reasoning so they can analyse shapes and their properties, and confidently describe the relationships between them. It should ensure that they can use measuring instruments with accuracy and make connections between measure and number. By the end of year 4, pupils should have memorised their multiplication tables up to and including the 12 multiplication table and show precision and fluency in their work. Pupils should read and spell mathematical vocabulary correctly and confidently, using their growing word reading knowledge and their knowledge of spelling.

(Click on the links in the notes section to be taken to the early years development matters document and to the program of study in the national curriculum for maths for a more detail breakdown)

How is learning assessed?

Teachers use a broad range of assessment tools, including standard tests, daily maths books and teacher assessment. Testing takes place at the end of each unit and term and this alongside daily lessons informs teachers of the levels (working towards, expected, greater depth) that each child has achieved. These tools allow teachers to effectively monitor progress, target gaps in children's understanding and provide a tailored approach to their daily practice.

In the Early Years Foundation Stage, focused adult led learning tasks form the basis of the primary assessment, this is then consolidated through children accessing maths independently in the setting. These observations and achievements are assessed against the development matters working towards all children achieving the expected level of development by the end of the Reception year.

How does it promote fundamental British Values?

The mathematics curriculum promotes the British values of tolerance and resilience on a daily basis through problem solving and understanding of complex concepts, encouraging students to persevere and try different methods to arrive at a correct solution. Teamwork through peer assessment and group work underpins the schemes of learning in the maths faculty. Children work together in all areas of the maths curriculum to support each other and build mutual respect for one another. Children are allowed to make mistakes and learn from them in all maths lessons. This fosters confidence and builds self-esteem, it encourages students to take risks and become lifelong learners whilst using their mathematical skills in all aspects of life

How does it promote SMSC?

S- In mathematics pupils are always encouraged to challenge their understanding of Mathematics and how it relates to the world around them. The skills of analysing data are taught from years 2-6 to enable children to make sense of the vast amounts of data available in the modern world around them. They develop a fascination about how currency can be used in their everyday lives. Also life skills such as telling the time, reading measurements and scales are taught in exciting contextual lessons. Children are given the choice in many lessons regarding the numbers or methods that they use. They are also able to choose their own problems and begin to create their own.

Within Foundation stage children begin to explore shapes in the world around them and are able to talk creatively using mathematical language when constructing and describing models

M - Within Mathematics children will recognise how logical reasoning can be used to consider the consequences of particular decisions and choices. Children explore a range of Mathematical investigations where they are challenged and made aware that there may be more than one solution. On the other hand, they are also aware that some problems require one correct answer. A variety of lessons and closing the gap comments require children to prove or explain whether an answer is right or wrong. This helps the children to learn the value of mathematical truth. Mathematical reasoning is developed through guided group work where the children are encouraged to talk about their leaning and listen to other viewpoints

How does it promote SMSC?

S - Problem solving skills and teamwork are fundamental to Mathematics, through creative thinking, discussion, explaining and presenting ideas. Throughout the key stages, children are provided with opportunities to work together productively on mathematical tasks and supported to see that the result is often better than any of them could achieve separately. Experimental and investigation work provides an ideal opportunity for children to work collaboratively.

C - Within Key Stage One and EYFS, children begin to understand the importance of counting and explore early counting ideas from other countries, such as tallies. Towards the end of Key Stage One, children explore the importance of zero as a place holder. In Key Stage Two, children begin to explore more developed number systems, such as Roman numerals. This supports the children to realise how our counting system has developed throughout the ages and shaped the decimal system that we use today.