Courage Compassion Respect

Mathematics at Silchester Church of England Primary

Mathematics is a creative and highly interconnected 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.

National Curriculum 2014

Intent

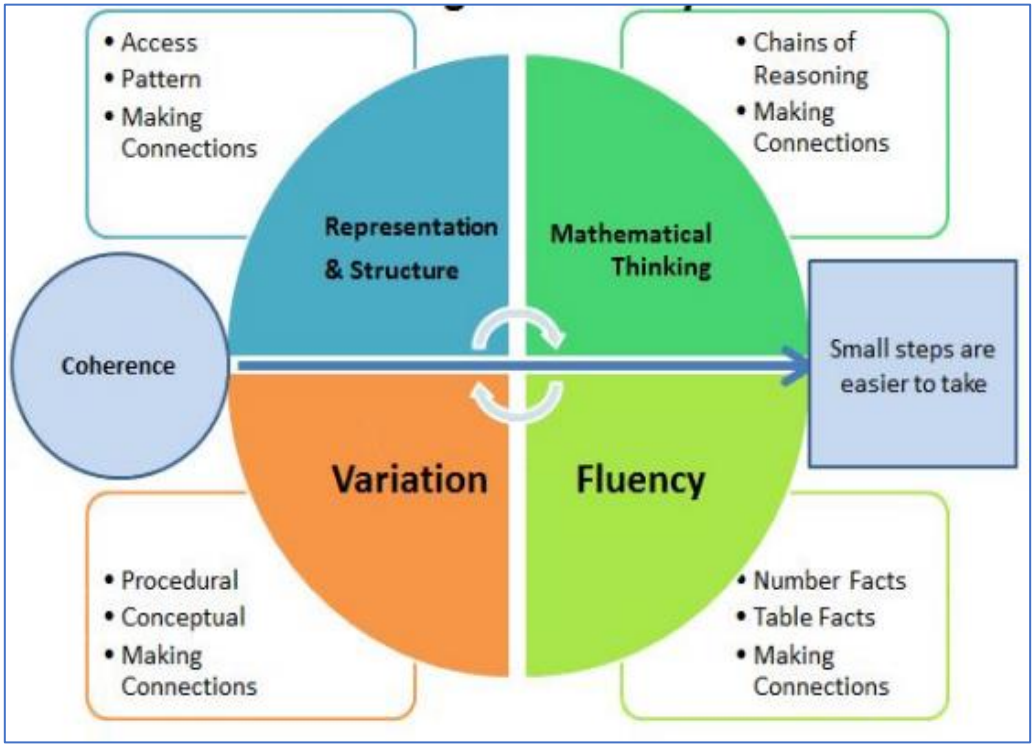
At Silchester, we want all children to discover the wonder of mathematics. We aspire for all children to thrive in mathematics by being inquisitive, inspired and ambitious mathematicians who enjoy questioning, enquiry and discovery. Children are taught mathematics through progressive and challenging curriculum. Lessons provide opportunities for all of Silchester's developing mathematicians to become fluent in the fundamentals of mathematics through intelligent practice of number with increasing complexity over time; reason mathematically through investigating, conjecturing and gathering proof; be problem-solvers who persevere in seeking solutions and enjoy taking risks. We encourage parents and carers to regularly practise number facts with their children, explore the use of mathematics in the real world and promote a love of mathematics.

Implementation

Our maths curriculum and pedagogy aims to provide the opportunity for all children, regardless of their ability, to become confident and proficient mathematicians. In EYFS, mathematics is taught through an integrated approach using material from NCETM Mastering Number, White Rose Maths and Numberblocks. In years 1 to 6, The Hampshire Scheme of Learning is implemented with teachers using resources from NCETM, White Rose and I See Reasoning. Our mathematics curriculum encompasses a cyclic model to the teaching mathematics. This enables children to build on prior learning and develop mathematical knowledge and skills over time, ensuring learning is progressive and well sequenced. Children are encouraged to develop fluency in their recall of key facts and a whole school approach to the teaching of calculation is implemented across the school using the Hampshire calculation policies. Additional time is allocated to arithmetic to ensure key skills in calculation are

retained. Reasoning and problem-solving skills are explicitly taught to enable children to become independent learners who are prepared to take risks. The teaching of multiplication facts continues to be a discrete focus, where the applications of these skills are essential for accessing other areas of mathematics. To make the learning relevant, cross-curricular links are made wherever possible and children are encouraged to apply skills from all areas to complete real-life challenges and give learning a sense of purpose.

Across the school, Maths Mastery approach is implemented whereby planning focuses on developing the five mastery big ideas:



Mastery Big Ideas	
Coherence	Teaching is designed to enable a coherent learning progression through the curriculum, providing access for all children to develop a deep and connected understanding of mathematics that they can apply and communicate in a range of contexts.
Representation and Structure	Teachers carefully select representations of mathematics to expose mathematical structure. The intention is to support children in 'seeing' the mathematics, rather than using the representation as a tool to 'do' the mathematics. These representations become mental images that students can use to think about and discuss mathematics, supporting them to achieve a deep understanding of mathematical structures and connections.
Mathematical Thinking	Mathematical Thinking is central to how children learn mathematics and includes looking for patterns and relationships, making connections, conjecturing, reasoning, and generalising. Children should actively engage in mathematical thinking in all

	lessons, discussing and communicating their ideas using precise mathematical language.
Fluency	Efficient, accurate recall of key number facts and procedures is essential for fluency, freeing children' minds to think deeply about concepts and problems, but fluency demands more than this. It requires children to have the flexibility to move between different contexts and representations of mathematics, to recognise relationships and make connections, to explain their ideas and to choose appropriate methods and strategies to solve problems.
Variation	The purpose of variation is to draw closer attention to a key feature of a mathematical concept or structure through varying some elements while keeping others constant. Through variation the teacher focuses thinking and discussion on the key feature in question. Conceptual variation involves varying how a concept is represented to draw attention to critical features. Often more than one representation is required to look at the concept from different perspectives and gain comprehensive knowledge. Procedural variation considers how the student will 'proceed' through a learning sequence. Purposeful changes are made in order that children' attention is drawn to key features of the mathematics, scaffolding students' thinking to enable them to reason logically and make connections.

Underpinning Principles

- Everyone can learn and enjoy mathematics.
- Developing learning behaviours so that children focus and engage fully as learners is paramount to supporting their reasoning and seeking to make connections.
- Teachers continually develop their specialist knowledge for teaching mathematics, working collaboratively to refine and improve their teaching.
- Curriculum design ensures a coherent and detailed sequence of essential content to support sustained progression over time.

Lesson Design

- Lesson design links to prior learning to ensure all can access the new learning and identifies carefully sequenced steps in progression to build secure understanding.
- Examples, representations and models are carefully selected to expose the structure of mathematical concepts and emphasise connections, enabling children to develop a deep knowledge of mathematics.
- Procedural fluency and conceptual understanding are developed in tandem because each supports the development of the other.

- It is recognised that practice is a vital part of learning, and the practice must be designed to both reinforce children' procedural fluency and develop their conceptual understanding.

In the Classroom

- Children are taught through whole-class interactive teaching.
- In lessons, the adults lead back and forth interaction, including questioning, short tasks, explanation, demonstration, and discussion, with clear metacognition being shared, enabling children to think, reason and apply their knowledge to solve problems.
- Use of precise mathematical language enables all children to communicate their reasoning and thinking effectively.
- Significant time is spent developing deep understanding of the key ideas that are needed to underpin future learning.
- Key number facts are taught deeply, and practised regularly retrieval opportunities. This is to avoid cognitive overload in working memory and enable children to focus on new learning.

Intended Impact

- For children to love mathematics.
- For children to leave us with a deep understanding and appreciation of mathematics in the world around them.
- For children to wonder, investigate and be curious, as well as to be proficient in recall of facts, calculation and application of mathematical knowledge and skills.
- The % of children working at ARE within each year group will be at least in line with national averages.
- The % of children working at Greater Depth within each year group will be at least in line with national averages.
- Pupil premium children will make good progress from their starting points and the gap between them and others is narrowed.

Aims

We aim for all our mathematicians to:

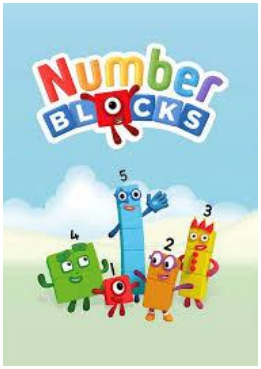
- explore and investigate using what they know
- ask questions, create rules and gather proof
- challenge themselves and be resilient

- use concrete resources, pictures and mathematical language
- develop ideas and explanations
- practise to be confident and accurate in recall and calculation

Subject Organisation

Mathematics is taught in daily lessons and cross curricular opportunities are given for children to use their mathematics knowledge and skills in other subjects. Mathematics teaching includes modelled examples, sharing thinking and guided work, alongside independent practice that moves learning forward. Careful planning is given to developing children's representation of mathematical concepts, developing mathematical thinking and fluency. Children are taught to use mathematical language to talk about their ideas, discuss what they notice and make connections between existing knowledge and new learning.

EYFS



- Follow the EYFS Framework
- Combination of adult-led activities and child-initiated activities both inside and outside of the classroom to develop number sense
- Use of NCETM Mastering Number, White Rose Maths and Numberblocks.
- Wide range of structured play resources available to them throughout the year (continuous provision).
- Adults model the use of these resources and the appropriate mathematical language as they support the children in their play.
- Daily maths sessions with whole-class input followed by small group activities

KS1

- Hampshire Scheme of Learning
- Year 1, maths in continuous provision
- Daily maths lessons, 40 minutes in duration.
- Daily maths starter, 5 to 10 minutes for retrieval opportunities in counting and number facts
- In Year 2, the 2, 10 and 5 timestables are introduced with a focus on teaching one timestables per half-term.

KS2

- Hampshire Scheme of Learning
- Daily maths lessons, 50 minutes in duration.
- Daily maths starter, 5 to 10 minutes for retrieval opportunities in counting and number facts
- In Years 3 & 4, timestables continue to be taught with a focus on one timestables per half-term.
- Year 3 & 4, 3x weekly timestable sessions, practising timestables previously introduced in main lessons

- Year 4, 2x weekly use of Timestable Rockstars to practise timestables electronically
- Year 6, daily morning activities for 15 minutes practising arithmetic and calculation previously taught.

Supporting children to at least make good progress

If a child does not to grasp a concept or procedure taught, we are developing pedagogy to identify this quickly during lessons, and are working on systematically addressing gaps in understanding to prevent children falling behind. This may come in the form targeted adult guided group during lessons and /or mathematics intervention outside of the main mathematics focusing on particular area or skill. For further information on addressing misconceptions in lesson, see Silchester's Responsive Teaching Toolkit.

Subject Developments at Silchester

At Silchester we strive for continuous improvement. The next steps for our maths curriculum and pedagogy are to further develop the precise and consistent teaching of mathematical thinking using representation and mathematical language to support this, as well as developing challenge for all, particularly for children working at greater depth.

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