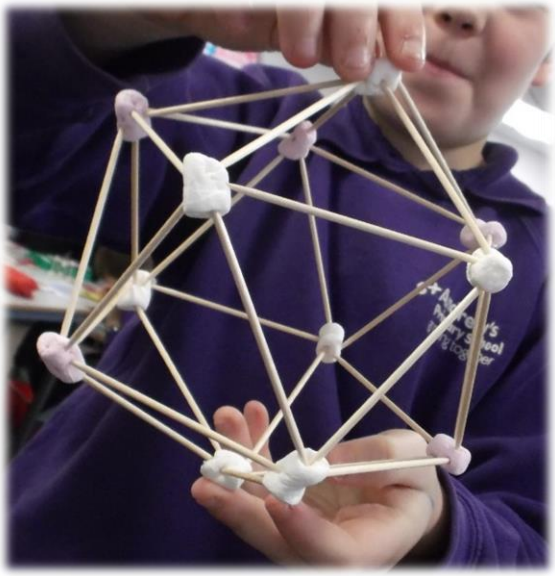
MATHEMATICS CURRICULUM GUIDANCE

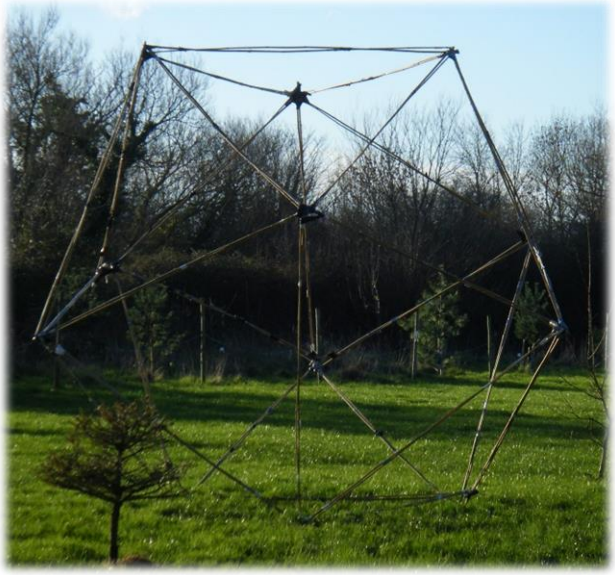
"Without mathematics, there's nothing you can do. Everything around you is mathematics. Everything around you is numbers."

Shakuntala Devi, Indian writer and mental calculator

Mathematics Intent

At St. Andrew's, it is our belief that all children have the right and the capabilities to become confident and competent mathematicians. We foster a positive can-do attitude towards maths encouraging children to BELIEVE in themselves as mathematicians and develop the power of resilience and perseverance when faced with mathematical challenges; having the courage to take risks in their learning. Our aim is to develop in each child a deep, conceptual understanding of mathematical skills, knowledge and vocabulary through a mastery approach to maths. We want children to become fluent in the fundamentals of mathematics, make connections across areas of maths and in other subjects, be able to reason and to solve problems selecting which mathematical approach is most effective in different scenarios. Maths is essential to everyday life; is the foundation for understanding the world and how it operates. We want our children to know the purpose behind their learning; to apply their knowledge to their everyday lives; have an appreciation of the beauty and power of mathematics and leave them with a legacy of enjoyment and curiosity about the subject.



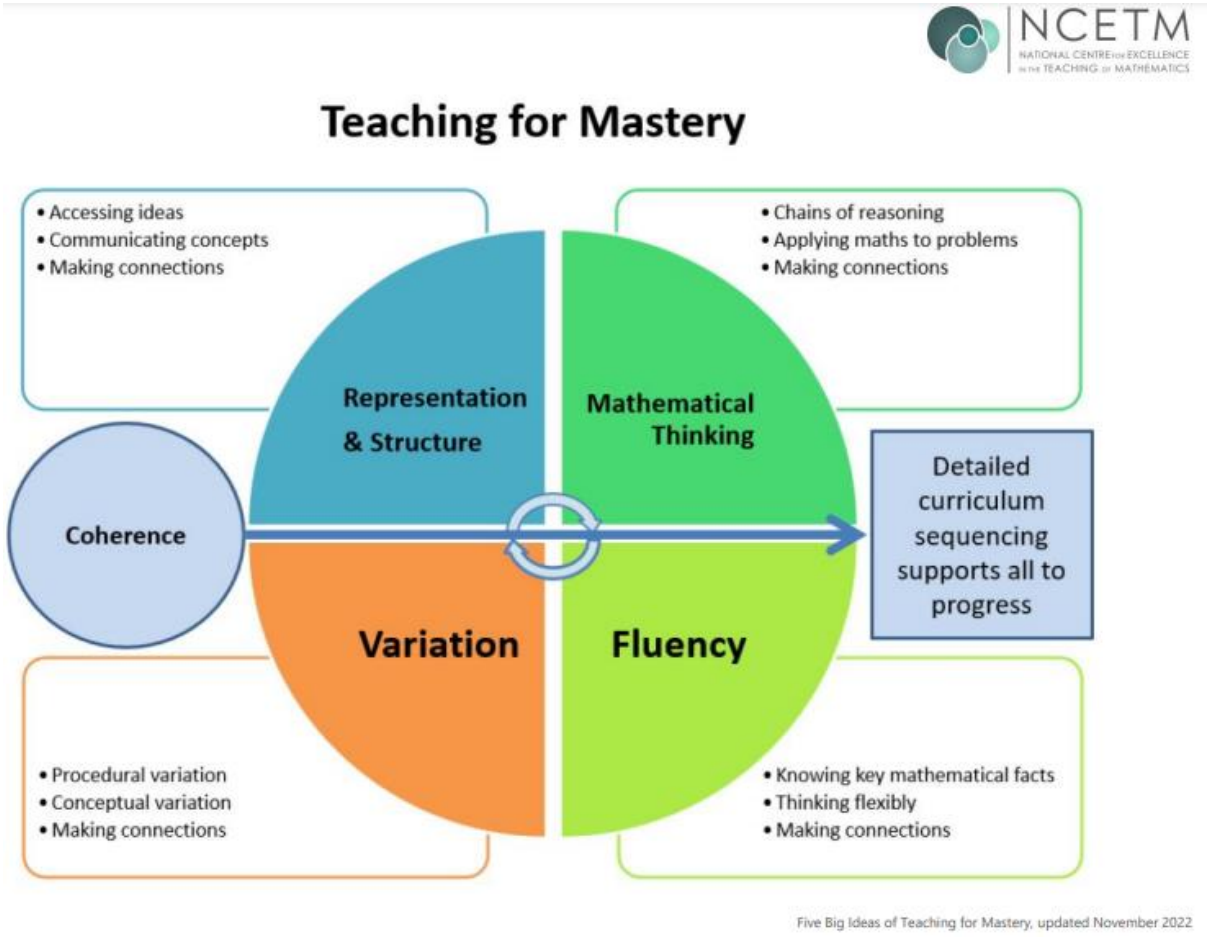


"Just because we can't find a solution, it doesn't mean there isn't one."

Andrew Wiles, English mathematician

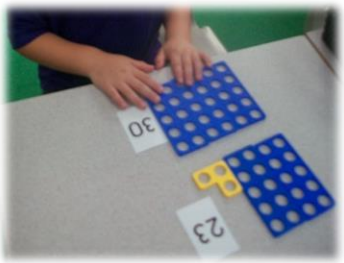
Mathematics Implementation

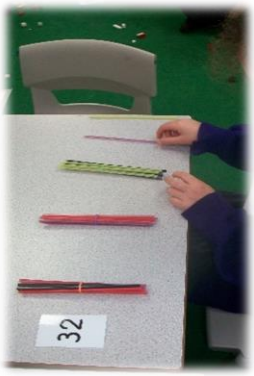
At St. Andrew's, we use White Rose Maths as a framework for teaching as it uses carefully sequenced steps in progression to build secure understanding; it addresses the three key aims of the National Curriculum: fluency, reasoning and problem solving and follows the principles of teaching for mastery. 'Mastering mathematics' means children acquiring a deep, long-term, secure and adaptable understanding of the subject. The NCETM have drawn upon research to identify 'Five Big Ideas' which are key to our teaching:



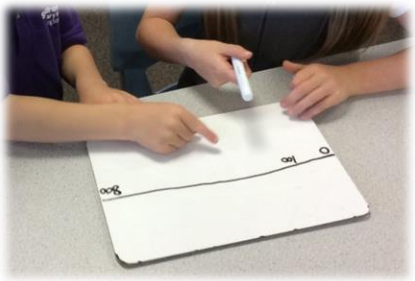
In all year groups, we use the concrete-pictorial-abstract (CPA) approach and encourage children to use manipulatives and diagrams (such as part/part whole and bar models) to support their learning.

- *Concrete* – Children have the opportunity to use concrete objects and manipulatives to help them understand and explain what they are doing.

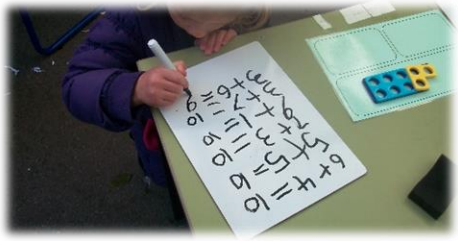


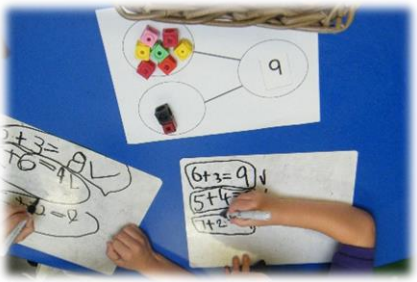


- *Pictorial* – Children then build on this concrete approach by using pictorial representations which can then be used to reason and solve problems.



- *Abstract* – With the foundations firmly laid, children can move to an abstract approach using numbers and key concepts with confidence.





"The only way to learn mathematics is to do mathematics."

Paul R. Halmos, Hungarian-American mathematician

At St. Andrew's, the majority of children will be taught the content from their year group only. They will spend time becoming true masters of content; applying and being creative with new knowledge in multiple ways. For those children who are working outside of the year group curriculum, individual learning activities are provided to ensure their progress.

Staff are supported with shared planning approaches to ensure consistency in maths across the school. A typical maths lesson will provide the opportunity for all children, regardless of their ability, to work through fluency, reasoning and problem solving activities. We encourage children to struggle with problems; to use mistakes and misconceptions as an essential part of learning, planning for them in lessons. Our calculation progression is used within school to ensure a consistent approach to teaching the four operations over time. Children are taught through clear modelling and given visual representations to aid their understanding. To improve maths oracy we use a range of strategies: for example, talk/learning partners/trios, stem sentences, sentence repetition. Questioning is a key part of the maths lesson: encouraging children to notice, wonder and spot links – letting the children demonstrate what they know, challenging them every step and then celebrating the diverse strategies used to answer a problem. Challenge is visible throughout the session where children are asked to reason and prove their understanding at a deeper secure level. Support is determined during each lesson to ensure secure understanding based on the needs of the child. If a child has not understood the learning intention in that lesson, teachers are encouraged, if possible, to tackle misconceptions and consolidate learning during the lesson or support them later that day or the following day.

We have a commitment to the professional development of our staff through regular maths staff training to ensure high-quality teaching. We work with the NCETM (National Centre for Excellence of Teaching in Mathematics) through our work with the Boolean Maths Hub.

"Nature is written in mathematical language."

Galileo Galilei, Italian astronomer, physicist and engineer

"The study of mathematics, like the Nile, begins in minuteness but ends in magnificence."

Charles Caleb Colton, English cleric, writer and collector

Mathematics Impact

Throughout their learning journey at St. Andrew's, children will make strong links between key concepts in maths and be able to recall specific knowledge required for solving problems. They will become confident in explaining their mathematical thinking and reasoning using correct vocabulary which will demonstrate their understanding.

Throughout each lesson formative assessment takes place and feedback is given to the children which may include next steps to ensure they are meeting the specific learning objective. Teachers then use this assessment to influence their planning and ensure they are providing a mathematics curriculum that will allow each child to progress. The teaching of maths is also monitored through moderation, book scrutinies, learning walks, lesson observations, pupil progress meetings and performance management. Children regularly complete a summative assessment to help them to develop their testing approach and demonstrate their understanding of the topics covered. The results from both the formative assessment and summative assessment are then used to determine children's progress and attainment. The expectation is that the majority of pupils will move through the programmes of study at broadly the same pace. However, decisions about when to progress should always be based on the security of pupils' understanding and their readiness to progress to the next stage. Pupils who grasp concepts rapidly should be challenged through being offered rich and sophisticated problems before any acceleration through new content. Those who are not sufficiently fluent with earlier material should consolidate their understanding, including through additional practice, before moving on.

"Wherever there is number, there is beauty."

Proclus, Greek philosopher

"Pure mathematics is, in its way, the poetry of logical ideas."

Albert Einstein, German theoretical physicist