Maths @ St Aloysius

At St Aloysius we have adopted a 'Mastery' approach to teaching and learning in Mathematics. We empower our children with a 'CAN DO' attitude. We encourage children to develop their knowledge and understanding of mathematics and aim for all pupils to enjoy and achieve in mathematics and become confident mathematicians.

Mathematics is a creative and highly inter-connected 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)

At St Aloysius, the focus is on the development of deep structural knowledge connected to the Big Ideas in Mastery in order to make connections. Making connections in mathematics deepens knowledge of concepts and procedures, ensures what is learnt is sustained over time, and cuts down the time required to assimilate and master later concepts and techniques.

MathsHUBS

St Aloysius is part of the North East Maths Hub, a maths leadership network which allows our maths leaders to work collaboratively with other schools to ensure that we deliver an exceptional maths curriculum.

Maths mastery is a transformative approach that has positive impact in our classrooms by:

- **Securing Understanding**: Mastery learning approaches emphasise a deep, secure understanding of mathematical concepts. This is achieved by focusing on one concept at a time until it is fully understood before moving on to the next.
- **Foundational Knowledge**: Mastery learning builds foundational knowledge by revisiting concepts in different contexts, reinforcing understanding and retention.
- **Planning Lessons**: Lessons are structured to gradually introduce new concepts, building on previous knowledge and allowing students to make connections.
- **Maths Activities**: Incorporate a variety of maths activities that encourage active learning. This could include problem-solving tasks, group work, or practical activities using manipulatives.
- **Positive Impacts**: Research has shown that mastery learning can lead to improved outcomes. For example, a study found that students taught using mastery methods achieved higher scores in maths tests.
- **Deeper Understanding**: Mastery learning promotes a deeper understanding of maths by encouraging students to think critically and solve problems independently.
- **Adaptive Teaching**: While all students work on the same topic, tasks can be adapted. This ensures that all students are challenged at their level.
- **Assessment**: Regular formative assessments are used to identify gaps in understanding and inform future teaching.
- **Professional Development**: Our teachers engage in ongoing professional development to enhance their understanding of mastery learning and its implementation.

Intent



At St Aloysius we follow the National Curriculum for mathematics, which aims to ensure that all children:

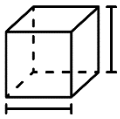
- become fluent in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately.
- reason mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language.
- can solve problems by applying their mathematics to a variety of routine and non-routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.

Our intention is that:

- Skills are embedded within a high-quality mathematics education taught from the earliest age and developed consistently over time through the delivery of an engaging and inspiring curriculum.
- All children can be successful in the study of mathematics. We do not accept that 'some children cannot do maths' or that children should be limited by prior attainment. Our motto is 'I can't do it…Yet!'. We advocate a growth mindset and teach the skills to ensure that our children are resilient learners who become life-long mathematicians.
- We are committed to ensuring that our children are able to recognise the importance of maths in the wider world and that they are able to apply their mathematical skills and knowledge confidently in their day to day lives and within a wide range of contexts.
- All children enjoy maths and experience success in the subject, with the ability to problem solve and reason confidently. We are committed to developing children's curiosity about the subject, as well as an appreciation of the beauty and power that can be found in the methodology, sequences and patterns of Mathematics.
- Teachers promote children's enjoyment of maths and provide opportunities for them to build a deep, conceptual understanding of maths before applying their knowledge to everyday problems and challenges.
- Challenge is provided for all children, whatever their understanding. Children make rich connections across mathematical ideas to develop fluency, mathematical reasoning and competence in solving increasingly sophisticated problems.
- Children apply their mathematical knowledge to science and other subjects.
- 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 will always be based on the security of pupils' understanding and their readiness to progress to the next stage. Pupils 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, through additional practice, before moving on.

Implementation





- To ensure consistent coverage, teachers follow the White Rose scheme of learning to support their planning. The school also subscribes to Power Maths which works in partnership with White Rose and provides staff with a wide variety of resources from which to plan and teach high quality lessons. Teachers are also encouraged to use resources from NRich and NCETM to support, stretch and challenge all children in their classroom. Staff are working on a whole to develop their understanding of mastery through ongoing work with the Great North Maths Hub.
- Staff deliver the maths curriculum with a focus on the **concrete, pictorial, abstract** approach. By using all three, children can explore, demonstrate and deepen their mathematical learning. Together, these elements help to cement knowledge so that children can truly understand and internalise what they have learnt.

- When introduced to a new concept for the first time, children are encouraged to physically represent mathematical concepts. Objects and pictures are used to demonstrate and visualise abstract ideas, alongside numbers and symbols. Throughout St Aloysius, you will see these three methods being used:

Concrete

This is the 'doing' stage where children have the opportunity to use concrete objects and manipulatives to help them understand and explain what they are doing. It brings concepts to life by allowing them to handle physical objects themselves.

Pictorial

This is the 'seeing' stage, using representations of the objects involved in maths problems. This stage encourages children to make a mental connection between the physical object and abstract levels of understanding, by drawing or looking at pictures, circles, diagrams or models which represent the objects in the problem.

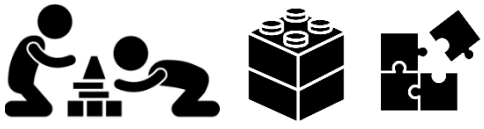
Abstract

This is the 'symbolic' stage, where children are able to use abstract symbols to model and solve maths problems

$$2 + 1 = 3$$

Regular and ongoing assessment informs teaching, as well as intervention, to support and enable the success of each child. These factors ensure that we are able to maintain high standards, with achievement at the end of KS2 well above the national average, as well an increasingly high proportion of children demonstrating greater depth, at the end of each phase.

EYFS



Work undertaken within the Foundation stage is guided by the requirements and recommendations set out in the Early Years Statutory Framework. All children are given ample opportunity to develop their understanding of mathematics. Lessons in the early years follow a mastery approach and use concrete and pictorial representations to develop an understanding of mathematics. Teachers plan for learning using Mastering Number resources (NCETM) and White Rose. Children are encouraged to use, enjoy, explore, practice and talk confidently about mathematics using reasoning. The children are exposed to rich problems and use practical resources like Numicon, ten frames and other concrete material to master key concepts. Story books and rhymes are also used to explore different mathematical concepts.

Impact

- Teachers use formative assessment to evaluate learning during the lesson. They will ask questions to check understanding and scrutinise independent work in order to identify common misconceptions. Such assessment allows teachers the flexibility to intervene in a lesson to remind, redirect or re-teach pupils as required.
- Daily marking of independent work allows teachers greater understanding of whether or not a concept has been grasped and gives the opportunity to provide praise and feedback in order to reinforce learning. It also allows them to reflect on how successful they were in the delivery of their lesson.
- Formal end of unit White Rose tests, used alongside termly summative assessments, allow teachers to evaluate how individuals, groups and the class as a whole are progressing compared to national expectations. They also provide excellent opportunities to see which concepts need to be given additional time – planning will be adjusted accordingly. This gives the Maths Leader and Senior Leadership the insight to see where the strengths and weaknesses lie, where additional support needs to be focused and what training/ CPD requirements are.
- The combination of all of these systems allows us to judge the impact of the maths curriculum in our school.