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| Mathematics Curriculum Design | | | | | |
| Curriculum Intent | | | | | |
| At S.S John and Monica we recognise that Mathematics is essential to everyday life, critical to science, technology and engineering, and necessary for financial literacy and most forms of employment. We aim to provide a high-quality mathematics education with a mastery approach so that all children:  • become fluent in the fundamentals of mathematics;  • reason mathematically;  • can solve problems by applying their mathematics. (National Curriculum 2014)  It is our intent to provide children with a high-quality, broad and challenging Mathematics curriculum with the development of children’s ‘maths sense’ and enjoyment at the heart of each maths lesson. We believe that all pupils can succeed in mathematics. We don’t believe that there are individuals who can do maths and those that can’t. A positive teacher mind-set and strong subject knowledge are key to student success in mathematics. By building confidence, resilience and a passion for maths, we can show that whatever your prior experience or preconceptions, maths is an exciting adventure that everyone can enjoy, value and master!  We want our children to acquire maths knowledge progressively. Knowledge helps children to sharpen their thinking skills and makes learning easier. Knowledge is not only cumulative, it grows exponentially. Those with a rich base of factual knowledge find it easier to learn more. Here at S.S John and Monica we want our children to develop three types of mathematical knowledge:   * Declarative knowledge- ‘I know that…’- having knowledge of facts, formulae, concepts, principles and rules. * Procedural knowledge- ‘I know how…’- recall as a sequence of steps including methods, algorithms and procedures. * Conditional knowledge- ‘I know when…’- the ability to reason and solve problems and use combinations of declarative and procedural knowledge which can be transformed into strategies when children learn to match the problem types they can be used for.   *‘The intention of these approaches is to provide all children with full access to the curriculum, enabling them to achieve confidence and competence – ‘mastery’ – in mathematics, rather than many failing to develop the maths skills they need for the future.*’ NCETM 2014 | | | | | |
| Curriculum Implementation | | | | | |
| At SS John and Monica all mathematic policy and guidance follows recommendations and guidance as set out by the NCETM/Maths hub. Our policy and lesson design follow a research and best practice model.  Each maths lesson follows an episodic teaching sequence where each ‘mini episode’ within a lesson builds towards mastery and understanding of a small mathematical step. We use the White Rose Schemes of Learning to guide our teaching of maths from Reception to Year 6. White Rose is based on the mastery approach which is used so successfully in countries such as Singapore.  Our curriculum is broken down into small, manageable steps that all children work on in a daily lesson together to both avoid cognitive overload and facilitate effective explicit instruction though quality first teaching. Those who need more support are given additional help either in the lesson, before or afterwards following the same day catch up/keep up model, yet all children work on the same lesson objective unless they are unable to due to complex SEN needs. Pupils who rapidly grasp concepts are given rich and sophisticated tasks to deeper problems to build a more profound understanding.  We want children to think and behave like mathematicians and not just ‘do’ maths; our maths lessons and learning is cumulative and we interweave prior content in new concepts. For example when children look at measurement, there are lots of questions that practice the four operations and fractions. This helps children make links between topics and understand them more deeply. There is a distinct focus on number work as children who have an excellent grasp of number make better mathematicians. Spending longer on mastering key topics will build a child’s confidence and help secure understanding. We look to reinforce number fluency throughout the year. This is done using calculation sessions each morning (KS2) or afternoon (KS1), where children focus on set written calculations, mental calculations or recap prior learning in line with their year group expectations.  It is through following a mastery approach and progressively developing the knowledge and skills needed to both meet and exceed the expectations set out in the national curriculum programmes of study that our children will acquire deep, long term, adaptable and secure understanding of all things maths. Here at S.S John and Monica we see maths mastery as three dimensions: conceptual understanding, mathematical thinking and language and communication. These are the key ‘ingredients’ to ensure that we provide children with the knowledge and skills that enable them to access the curriculum in full building competent and confident mathematicians.   * Conceptual understanding – Mathematics tasks are about constructing meaning and making sense of relationships. Children deepen their understanding by representing concepts using objects, pictures, symbols and words (concrete, pictorial and abstract-CPA) * Mathematical thinking – Children develop mathematical ‘habits of mind’ – to be systematic, generalise and seek out patterns. They think mathematically and are given tasks that require them to specialise and generalise, to work systematically, to generate their own examples, to classify and to make conjectures. * Communication and language – Mathematical language strengthens conceptual understanding by enabling pupils to explain and reason. The more learners use mathematical words the more they feel themselves to be mathematicians. Talk is an essential element of every lesson and time is dedicated to developing confidence with specific vocabulary as well as verbal reasoning.   Our maths progression in both knowledge and skill is organised into 4 set milestones Early Learning (Reception) Milestone 1 (Year 1 and 2) Milestone 2 (Year 3 and 4) and Milestone 3 (Year 5 and 6). Each milestone builds upon prior learning and knowledge following a spiral curriculum approach. Throughout each milestone we value and promote reasoning explicitly, persistently, consistently and frequently and, in particular, help children to develop complete chains of reasoning. This aspect of mathematics helps children to deepen understanding and extend our higher attainders as we take them onto generalisations and proof, whilst focusing on the same mathematical content  Frequent end of unit assessment and teacher feedback aim to provide children with the chance to develop and demonstrate their increasing levels of skill and to support the ongoing teacher, pupil, parent assessment dialogue. In addition, teacher development is proactively planned to ensure that best practice is shared and is to the benefit of pupils and staff alike. | | | | | |
| Curriculum Impact | | | | | |
| It is through a well sequenced curriculum that builds upon prior learning and the reinforcement and repetition of knowledge and skills that our aim for all children to achieve age related expectations at the end of each year group will be achieved. Although, perhaps most importantly, we recognise the impact that creating children who are curious and competent mathematicians will produce life-long mathematical thinkers who will have the knowledge and skills required to achieve our core aim of preparing children to make positive contributions to the community we serve. We understand that having the right skill set will enable children to achieve all future aspirations; to use the talents that they have been blessed with. It is truly our aim to foster and develop a love of all things maths. It is though this love of maths that children will embrace the challenge that maths presents and develop resilience, confidence and a positive attitude towards the subject. The skills developed within our maths curriculum are interchangeable life skills which will prepare our children as they learn and grow. | | | | | |