Maths at St. Paul's Primary School

Intent

At St. Paul's we have high expectations of children and believe that all children can succeed in maths. Our aim is to equip all pupils with the skills and confidence to solve a range of problems through fluency with numbers and mathematical reasoning.

Over the last three years we have been developing our pedagogical approach to teaching maths and it is important to outline why maths lessons/books may look different to other schools.

This academic year we continue to use a Teaching for Mastery approach to mathematics. The content and principles underpinning this approach reflect those found in high performing education systems internationally, particularly those of east and south-east Asian countries such as Singapore, Japan, South Korea and China. Though there are many differences between the education systems of England and those of east and south-east Asia, we can learn from the 'mastery' approach to teaching which has been proven to improve standards of Maths.

The three aims of the National Curriculum (Fluency-Problem solving and Reasoning) are still addressed daily and underpin our planning and teaching (The national curriculum is a mastery curriculum).

Implementation - What you will see with a Teaching for Mastery approach

- **Whole class together -** we teach mathematics to whole classes and do not label children according to their perceived ability. Lessons are based on formative assessment of what children already know. At the planning stage teachers are able to identify what scaffolding may be required to support those who may struggle to grasp concepts and what suitable challenge questions can be developed for those who may grasp the concept quicker. In line with NCETM advice, one form of depth frequently used, during the first part of the lesson, is variation theory (conceptual and procedural). Variation is one of the five 'big ideas' at the heart of Teaching for Mastery. For example, a child who can produce a quick correct answer may be asked to solve the question using more than one other procedure, to represent the question in more than one way (such as the bar model or part whole).
- **Longer but deeper -** In order to meet the aims of the NC whilst ensuring children have a deep understanding of the concepts our medium term plans allow longer to be spent on key concepts. This is in line with White Rose Maths which we use to support our small steps planning. Each lesson focus is on a key mathematical concept but connections are made across mathematical ideas. Number sense and place value are at the heart of our teaching.

- **Questioning (mathematical language**) - Questions will probe children's understanding throughout and responses are expected in full sentences using key sentence stems (I know… If I know…then… I agree because…). Questions are also used to challenge thinking and check understanding. For example; How do you know? Prove it! Tell me more. What is the same/different? What is it? What is it not? Can you represent it another way? Children are expected to listen to each other's responses and may be asked to agree or disagree or explain further.
- **Exploration -** We have moved away from the more traditional three part lesson structure. Instead of 'let me teach you...' we use a teach do teach do model. Initially children are encouraged to explore a problem in context. This is referred to as the 'anchor task'. This allows for teachers to use AfL to unlock children's prior knowledge. Lesson objectives are not shared at the beginning of the lesson because we want the children to reason for themselves and understand what they have been learning and more importantly the 'why'.
- **Mathematical structure and representation -** The use of manipulatives to support learning will be evident in every lesson for every learner. Carefully chosen representations will enable to children to move on to the more abstract form of learning (the CPA approach). These representations will appear in books as children show their understanding, rather than a series of calculations.
- **Small steps planning -** Key learning points are identified during planning and a clear journey through the maths should be shown on flipcharts (also reflected on working walls). Learning points may appear to be very small but this is deliberate. For example, a whole lesson may be spent on adding the ones to a 3 digit number. The expectation is that every child will master the concept and some children will work more deeply on the same concept using variation theory and challenge tasks.
- **Fluency –** there is a whole school focus on developing an instant recall of key facts, such as number bonds, times tables, division facts, addition and subtraction facts. Additionally, we use Fluent in Five throughout KS2 to develop procedural fluency and from year 2 upwards we are using TT Rockstars to support the instant recall of times tables. This year we have continued with the program - Mastering Number in KS1. This program develops fluency in calculation and a flexibility with number that exemplifies good number sense.
- **Reasoning and Problem solving** – We continue to ensure this is embedded across the school and that all children are developing reasoning and a deep understanding (contexts and representations of mathematics). Problems are often set in real life contexts – carefully chosen practical resources and pictorial representations are used to explore concepts. These pictorial representations will appear in books as children show their understanding, rather than answers to a series of calculations. The use of practical resources, pictorial representations and recording takes place in every lesson (the CPA approach).
- **Marking** – the marking policy has been amended following the guidance from NCETM. Current marking policy is that learning is ticked or highlighted (incorrect). A comment is made if/when a teacher feels this is necessary to move learning forward. Gap tasks or challenges may appear for individual children in their books, but usually gaps are addressed through same day or early morning catch up and therefore will not always be recorded in books. The most valuable feedback is given during a lesson. Very often the children's next steps are addressed in the subsequent lessons and therefore will not appear as questions for some children to answer after a lesson has taken place or it will be followed up in the introduction the next day.
- **SEND pupils** – we have a mastery approach to teaching and learning to ensure that we are ambitious about what all children can achieve and we do not believe that their ability is fixed for every subject. In Maths, the use of concrete resources and visuals is extremely important in helping learners to access questions. Some learners may require different resources, which

could include different coloured paper, use of manipulatives to support their understanding. Mastering Number ensures that we prioritise the essential skills required to access the rest of the curriculum. Stem sentences are used within the classrooms to ensure that all children are able to access the language and share their understanding orally.

- **Mastery in the Early Years** – children explore mathematical concepts through active exploration and their everyday play based learning. Children are taught key concepts and application of number using a hands on practical approach. Following NCETM guidance, we have introduced Numberblocks to support the introduction of key concepts. EYFS practitioners provide opportunities for children to manipulate a variety of objects which supports their understanding of quantity and number. The CPA approach is used when teaching children key mathematical skills. Practitioners allow children time for exploration and the use of concrete objects helps to support children's mathematical understanding. Maths in the early years provides children with a solid foundation that will enable them to develop skills as they progress through their schooling and ensures children are ready for the Nation Curriculum.
- **A Growth Mindset –** we believe that all children can achieve in maths. Our belief is that pupils are neither 'born with the maths gene' nor 'just no good at maths. With good teaching, appropriate resources, effort and a 'can do' attitude all children can achieve in and enjoy mathematics. Developing children's perseverance and resilience is an important part of our maths teaching.

Impact

In order to measure the impact of our pedagogy and approach we will be carrying out:

- Book moderation within professional development meetings. This allows the whole staff to ensure consistency across classes and facilitates a professional dialogue where ideas are shared.
- Learning walks to observe mathematical talk and questioning within class. This enables SLT and maths lead to observe the impact of language on children's ability to reason verbally, a skill that is key to developing written reasoning.
- Leadership observations.
- Data scrutiny.