John Randall Primary School and Nursery

Statement of Intent for Mathematics

Intent

Why do we teach this? Why do we teach this in the way that we do?

The National Curriculum for mathematics aims to ensure that all pupils:

- 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.
- Be able to recognise the importance of maths in the wider world and be able to use their mathematics skills and knowledge confidently in their lives in a range of different contexts and subjects.

At John Randall Primary School and Nursery, our curriculum embraces these aims and hence these skills are embedded within our daily Maths lessons and developed consistently over time. We provide a curriculum that is accessible to all pupils in the school, from Nursery to the end of Year 6, and their varied educational needs. We are committed to ensuring that children are able to recognise the importance of Maths in the wider world and that they are also able to use their mathematical skills and knowledge confidently in their lives in a range of different contexts. We want all children to enjoy mathematics and to experience success in the subject, with the ability to reason mathematically.

We incorporate sustained levels of challenge through varied and high quality activities with a focus on;

Fluency: We intend for all pupils to 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.

Reasoning: We intend for all pupils to reason mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language.

Problem solving: We intend for all pupils to 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 daily mathematics curriculum also provides guidance to help pupils to become:

Visualisers – we use the Concrete, Pictorial, Abstract (CPA) approach to help pupils understand mathematics and to make connections between different representations.

Describers – we place great emphasis on mathematical language and questioning so pupils can discuss the mathematics they are doing and so support them to take ideas further.

Experimenters – as well as being fluent mathematicians, we want pupils to love and learn more about mathematics.

Implementation

What do we teach? What does it look like?

We implement a whole school approach through high quality teaching delivering appropriately progressive and challenging work for all individuals. For consistency in planning across the school we use the White Rose Maths planning model, which ensures firm foundations and sequences the learning concepts. Alongside this we use a range of planning resources to enhance our lessons and deepen understanding, including those provided by the White Rose Hubs, NCETM and NRICH. To support us we have a range of mathematical resources in classrooms including Numicon, Base10 and counters. Through our teaching we continuously monitor pupils' progress against expected attainment for their age, making formative assessment notes where appropriate and using these to inform our discussions in termly Pupil Progress Meetings and update our summative school tracker. The main purpose of all assessment is to always ensure that we are providing excellent provision for every child.

The expectation is that the majority of pupils will move through the programmes of study units 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 are 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, including through additional practice, before moving on.

The content and principles underpinning the 2014 Mathematics curriculum and the Maths curriculum at John Randall Primary School 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. These principles and features characterise this approach and convey how our curriculum is implemented:

- Teachers reinforce an expectation that all children are capable of achieving high standards in Mathematics.

- The large majority of children progress through the curriculum content at the same pace.

- Differentiation is achieved by emphasising deep knowledge and through individual support and intervention.

- Teaching is underpinned by methodical curriculum design and supported by carefully crafted lessons and resources to foster deep conceptual and procedural knowledge.

- Practice and consolidation play a central role. Carefully designed variation within this builds fluency and understanding of underlying mathematical concepts. Teachers use careful questions to draw out children's discussions and their reasoning.

- Teachers use precise questioning in class to test conceptual and procedural knowledge and assess children regularly to identify those requiring intervention, so that all children keep up. Children's explanations and their proficiency in articulating mathematical reasoning, with the precise use of mathematical vocabulary, are supported through the use of stem sentences provided by the teacher.

- Children are encouraged to solve problems each day through the use of concrete resources, pictorial representations and abstract thinking (the CPA approach). This helps children tackle concepts in a tangible and more comfortable way.

- Reasoning and problem solving are integral to the activities children are given to develop their mathematical thinking.

- Resources are readily available to assist demonstration of securing a conceptual understanding of the different skills appropriate for each year group.

- A love of maths is encouraged throughout school via links with others subjects, applying an ever growing range of skills with growing independence.

It is well documented that children can often underperform in Mathematics because they think they cannot do it or are not naturally good at it. John Randall Primary School has a nurturing ethos and our approach supports the children in developing their collaborative and independent skills, as well as empathy and the need to recognise the achievement of others. In addition, our approach encourages pupil engagement and enjoyment, alongside the development and more accurate use of their skills and knowledge in their application of maths in their problem solving. The White Rose Maths planning model addresses these preconceptions by ensuring that all children experience challenge and success in Mathematics by developing a growth mindset. Regular and ongoing assessment informs teaching, as well as intervention, to support and enable the success of each child.

To learn mathematics effectively, some things have to be learned before others. For example, place value needs to be understood before working with addition and subtraction, addition needs to be learnt before looking at multiplication (as a model of repeated addition). You will see this emphasis on number skills first, carefully ordered, throughout our mathematics curriculum. For some other topics, the order is not as crucial. For example, Shapes and Statistics need to come after number, but do not depend on each other. We try to mix these so pupils have as wide a variety of mathematical experiences as possible in each term and year.

Impact

What it will look like? By the time the children leave our school they will:

By the end of KS2 we aim for the children to be fluent in the fundamentals of mathematics with a conceptual understanding and the ability to recall and apply knowledge rapidly and accurately. They should have the skills to solve problems by applying their mathematics to a variety of situations with increasing sophistication, including unfamiliar contexts and apply these to real life situations. Children will be able to reason mathematically by following a line of enquiry and develop and present a justification, argument or proof using rich mathematical language.

Children, through discussion and feedback in pupil voice will talk enthusiastically about their Maths lessons and how they love learning and applying mathematical concepts. They can articulate the context in which Maths is being taught and relate this to real life purposes. Pupils will be able to evidence in knowledge how and why Maths is used in the outside world and in the workplace. They will know about the different ways that Maths can be used to support their future potential. Pupils will use acquired vocabulary in Maths lessons and they will have the skills to use methods independently and be able to show resilience when tackling problems. Teachers plan for breadth and depth, using a range of opportunities to use Maths inside and outside school.

Children will also;

- Demonstrate a quick recall of facts and procedures. This includes the recollection of times tables.
- Show confidence in believing that they will achieve.
- Achieve objectives and meet the expected standard for year group.
- Have the flexibility and fluidity to move between different contexts and representations of maths.
- Have the chance to develop the ability to recognise relationships and make connections in maths lessons.
- Demonstrate mathematical concepts or skills are mastered when they can show it in multiple ways, using the mathematical language to explain their ideas and can independently apply the concept to new problems in unfamiliar situations.
- Show a high level of pride in the presentation and understanding of their work.