



# **Mathematics Policy**

**September 2018**

## INTRODUCTION

This policy describes our approach to the Mathematics curriculum. It is to be used alongside the school calculations policy, which gives detailed guidance about the stages of mental and written calculations. Mathematics provides the basic skills which children need to become Mathematicians. The study of Mathematics is more than Numeracy.

Materials used for the teaching of Primary Mathematics:

- National Curriculum Programme of Study for KS 1&2
- Early Years Foundation Stage guidance
- Primary Framework used as guidance for Mathematics
- White Rose Small Steps Progression Medium Term Plans

This policy provides information for staff, parents and governors.

### **Importance Statement:**

*Mathematics introduces children to concepts, skills and thinking strategies that are essential in everyday life and support learning across the curriculum. It helps children make sense of the numbers, patterns and shapes they see in the world around them, offers ways of handling data in an increasingly digital world and makes a crucial contribution to their development as successful learners. Children delight in using mathematics to solve a problem, especially when it leads them to an unexpected discovery or new connections. As their confidence grows, they look for patterns, use logical reasoning, suggest solutions and try out different approaches to problems. Mathematics offers children a powerful way of communicating. They learn to explore and explain their ideas using symbols, diagrams and spoken and written language. They start to discover how mathematics has developed over time and contributes to our economy, society and culture. Studying mathematics stimulates curiosity, fosters creativity and equips children with the skills they need in life beyond school.*

### **Aims:**

At Julian's Primary School, children develop:

- Resilience and a growth mindset in maths so children can learn and challenge themselves free from maths anxiety
- a positive attitude towards mathematics as an engaging, relevant and exciting subject
- language and communication so that learners can scaffold, articulate and express their ideas using correct mathematical vocabulary
- deep conceptual understanding built on experiencing mathematical concepts in a varied way through a *concrete – pictorial – abstract* approach
- fluency and rapid recall of key number facts to free up cognitive load, enabling pupils to work efficiently
- the ability to think logically, systematically and flexibly;

### **Teaching and Learning:**

*We use a 'mastery approach' to teaching mathematics at Julian's Primary School. This means that:*

- Teaching is underpinned by a belief in the importance of mathematics and that the vast majority of children can succeed in learning mathematics in line with national expectations for the end of each key stage.

- The whole class is taught mathematics together, with no differentiation by acceleration to new content. The learning needs of individual pupils are addressed through careful scaffolding, skilful questioning and appropriate rapid intervention, in order to provide the necessary support and challenge. Mixed ability groups are used where possible, differentiated groups are never permanent and are based on prior assessment of a specific area being taught.
- Factual knowledge (e.g. number bonds and times tables), procedural knowledge (e.g. formal written methods) and conceptual knowledge (e.g. of place value) are taught in a fully integrated way and are all seen as important elements in the learning of mathematics.
- The reasoning behind mathematical processes is emphasised. Teacher/pupil interaction explores in detail how answers were obtained, why the method/strategy worked and what might be the most efficient method/strategy.
- Interim methods (e.g. expanded methods for addition and multiplication) to support the development of formal written algorithms are used for a short period only, as stepping stones into efficient, compact methods.
- Precise mathematical language, coached in full sentences, is always used by teachers, so that mathematical ideas are conveyed with clarity and precision. Pupils are required to do the same (e.g. when talking about fractions, part and its relationship to the whole are incorporated into responses: “The shaded part of the circle is one quarter of the whole circle”).
- Conceptual variation and procedural variation are used throughout teaching, to present the mathematics in ways that promote deep, sustainable learning. This incorporates the use of a concrete – pictorial – abstract approach where possible in all year groups.
- Carefully devised exercises employing variation are used. These provide intelligent practice that develops and embeds fluency and conceptual knowledge.
- Sufficient time is spent on concepts to ensure learning is well developed and deeply embedded before moving on.

### **Fluency and Rapid Recall:**

It is vitally important that children develop fluency and instant recall of key facts. This enables them to work efficiently and to free up cognitive load so that they can focus on more complex tasks without getting bogged down in the basics.

Mental mathematics strategies are practised each day through a mental/oral starter to encourage children into a mathematical way of thinking for their lesson.

*Key Instant Recall Facts (KIRFS)* is a tool we use to develop fluency and rapid recall systematically throughout the school. Every child is assessed at the start of each half term and given a target from the KIRFS for that half term. These targets focus on the key facts children need to have at their fingertips (multiplication and division facts, number bonds, halves and doubles, multiplying by 10, 100, 1000 etc.), The children practise these skills for homework and are regularly assessed in class to monitor progress. Once a target is met, a new one is set and so the cycle continues.

### **Planning:**

Years 1-2 use the White Rose Maths Hub small steps progression medium term plans to inform and guide their planning. Years 3-6 use the Power Maths unit plans. Both of these break concepts down into 'small steps', each of which is accompanied by suggestions for activities and questions to develop the children's fluency, reasoning and problem solving skills.

Planning is done in advance of teaching. This involves mapping out the objectives, investigations and calculation skills to be taught. There is a special emphasis on the likely misconceptions children are likely to have and activities are planned to reveal and clarify these.

More detailed weekly planning is done with particular focuses on the starter, questions and assessment. It should be very clear at the end of each lesson what children are **learning** as well as **doing**.

Relevant, helpful links should be made to other curriculum areas eg using measures in Science and Geography or using data handling in History or PSHE. ICT should be integrated into maths learning.

The mathematics subject leader will support year group leaders in monitoring planning and children's books over the academic year. Feedback is given and actions are followed up in future monitoring and support.

### **Recording:**

Children are expected to record calculations, diagrams and explanations independently from the earliest stages. Although there are times when worksheets are the most appropriate way to record information, they should be avoided as they can result in a form-filling exercise with little in the way of actual maths recorded.

Children record their learning in books with squared paper. However, blank paper may sometimes be more appropriate for certain open ended investigations or problem solving activities. Pupils in Years 3 -6 will record much of their work in their Power Maths pupil books Neatness and attention to detail are required in mathematics as much as in other subjects.

Rulers must be used accurately. Drawing straight lines using a ruler is a taught skill. Digits which are not written correctly must be corrected and examples given in children's books. All work should be dated with a learning objective and the date completed.

### **Assessment:**

Formal assessment is completed at three points in the year (October, February and May) using the PUMA tests from Rising Stars. Teachers, year group leaders and senior leaders use this data to analyse strengths and areas for development for individual pupils and groups of pupils. Question level analysis highlights areas of the curriculum which need revisiting or further consolidation.

Teachers use ongoing daily assessment of the children's work to inform next steps in teaching and groupings for the next lesson in the sequence.

Children will peer and self-assess their learning according to success criteria. Feedback to children should reflect the agreed success criteria and should refer back to the learning objective. Dots and ticks will be used in written feedback and examples should be given in marking when the children have not understood. Please refer to the marking policy for

further information.

The practice of reviewing anonymous examples of work, collectively discussing how errors have been made and suggesting how strategies could be improved is an aspect of assessment for learning which is promoted at Julian's.

### **Equal Opportunities:**

Effective pupil tracking and pupil progress meetings help to identify children who may require intervention, or who are not making good progress in relation to their starting points. We provide in class intervention through the class teacher and TA and effective challenge through differentiation. It is recognized that children who are learning English as an additional language may need additional support with the language of Maths. This is provided using specific strategies and visual cues as part of quality first teaching. At Julian's, we recognize that number systems and strategies come from many different parts of the world. We are committed to discovering, exploring and celebrating these with children.

### **Teaching for knowledge and understanding in greater depth:**

All children should be given the opportunity to access activities which encourage them to explore their mathematical understanding in greater depth; for example through problem solving activities which require them to make links between different areas of their maths learning.

Children who can regularly apply age appropriate knowledge in such activities are considered to have '76mastered' the curriculum for their year group. It is essential that children have demonstrated that they can do this before they are exposed to curriculum content from older year groups.

### **Resources:**

All classrooms have age-appropriate equipment. This should be used regularly and should be noted in planning. There is also a range of software available for developing maths concepts. Each classroom should have their maths targets displayed within the classroom and children should be aware of what they are working towards. Resources should be made available to children in lessons and independence in using them effectively, should be promoted.

All KS2 children are given a password for Mathletics. Children are given opportunities to practice their skill using Mathletics during class time and as part of homework.

### **Homework:**

Homework is given weekly – please see the homework policy for the requirements for each year group.

### **Parents/Carers:**

We are committed to keeping parents/carers up to date with current practice in Mathematics. We aim to provide parents/carers with information to help children with maths at home. All help and engagement from home is welcome!