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**The Laurels Primary School**

**Maths**

**2022-2023**

**The Importance of Mathematics**

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 in most forms of employment. A high-quality mathematics education, therefore, provides a foundation for understanding the world, the ability to reason mathematically and a sense of enjoyment and curiosity about the subject. Mathematics should help children to develop an appreciation of, and enjoyment in, the subject itself; as well as a realisation of its role in other curriculum areas.

**Purpose:**

The purpose of this policy is to describe our practice in Mathematics and the principles upon which this is based.

**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 have conceptual understanding and are able to recall and apply their knowledge rapidly and accurately to problems

• can 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.

**The Mastery Approach**

**The NCETM sets out the essential elements of teaching mathematics for mastery as follows:**

* The Essence of Maths Teaching for Mastery Maths teaching for mastery rejects the idea that a large proportion of people ‘just can’t do maths’.
* All pupils are encouraged by the belief that by working hard at maths they can succeed. Pupils are taught through whole-class interactive teaching, where the focus is on all pupils working together on the same lesson content at the same time, as happens in Shanghai and several other regions that teach maths successfully.
* This ensures that all can master concepts before moving to the next part of the curriculum sequence, allowing no pupil to be left behind.
* If a pupil fails to grasp a concept or procedure, this is identified quickly and early intervention ensures the pupil is ready to move forward with the whole class in the next lesson.
* Lesson design identifies the new mathematics that is to be taught, the key points, the difficult points and a carefully sequenced journey through the learning.
* In a typical lesson pupils sit facing the teacher and the teacher leads back and forth interaction, including questioning, short tasks, explanation, demonstration, and discussion.
* Procedural fluency and conceptual understanding are developed in tandem because each supports the development of the other.
* It is recognised that practice is a vital part of learning, but the practice used is intelligent practice that both reinforces pupils’ procedural fluency and develops their conceptual understanding.
* Significant time is spent developing deep knowledge of the key ideas that are needed to underpin future learning.
* The structure and connections within the mathematics are emphasised, so that pupils develop deep learning that can be sustained.
* Key facts such as multiplication tables and addition facts within 10 are learnt to automaticity to avoid cognitive overload in the working memory and enable pupils to focus on new concepts.

**Teaching and Learning mathematics**

**Planning**

**Daily Planning**

Teachers use White Rose Long term planning and resources. These are adjusted to meet the needs of the class with the recognition that the planning materials are not intended to be used ‘off the shelf’. Units may be moved around in the year to ensure key concepts are taught prior to statutory assessments.

Planning should involve the identification of the small learning steps students need to achieve their learning outcomes. Teachers recognise that children’s knowledge and understanding is not always aligned with age-related expectations and they plan according to children’s stage, not age.This can mean that planning is adjusted throughout the week for example if misconceptions arise or children quickly grasp content. Throughout the planning process teachers should identify potential misconceptions and address these through questioning and through the representations they choose. Questions and the different types of concrete, pictorial and abstract representations needed, are also identified during the planning stage. All children work on the same challenging objective during their maths lessons and quick grasping children are provided with opportunities to deepen and broaden their understanding rather than moving on to new concepts or content from older year groups. Our planning processes acknowledge that at any time during maths learning, *all* children can quickly grasp a concept and prior attainment does not put a cap on what experiences a child is going to be provided with.

Maths lessons begin with children being told ‘We are Learning to…’ and the learning objective.

These key principles underpin the planning of Maths at The Laurels.

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| Coherence | Representation and structure  | Mathematical thinking  | Fluency  | Variation  |
| Lessons are broken down into small connected steps that gradually unfold the concept, providing access for all children that enables them to apply the concept to a range of contexts.  | Representations used in lessons expose the mathematical relationships and structure being taught. | Ideas are worked on by the children: thought about, reasoned and discussed with ‘talk partners’. | We promote quick and efficient recall of facts and procedures and the flexibility to move between different contexts & representations.  | We aim to represent the concept being taught in more than one way. We encourage children to pay attention to what is kept the same and what changes.  |

**Fluency Planning**

Every class has a timetabled daily maths lesson and a separate daily fluency session outside of the main maths lesson. In Reception, Year 1 and Year 2 the teachers are trained to deliver the NCETM Mastering Number fluency sessions for which planning is provided. Children make use of Rekenreks to secure their Number knowledge. 

In KS2 teachers plan and deliver fluency based on the needs of their class, using a range of resources. These sessions are approximately 10 mins in duration and involve a range of concrete, pictorial and abstract approaches.The sessions are planned to be pacy and interactive.

**Representation**

Concrete, pictorial and abstract representations are used throughout the learning steps and teachers should aim to fade from concrete to pictorial and then abstract, with all three types of representation being present throughout, rather than being distinct phases. Teachers will also need to consider context and linguistic representations and how these can be used to secure a mathematical concept. For example the contextual representation of planning a stall at the summer fair may be more relatable to children than one which requires them to plan a budget for a holiday. Within the planning process representations are carefully selected to best support the teaching, with the knowledge that mathematical apparatus or abstract representations can both support but also mislead if not chosen discerningly. Teachers should also plan exposure to representations which demonstrate what a concept is *not*.

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**Mathematical Talk**

At The Laurels Primary School mathematical planning and in particular talk, is underpinned by a series of positive norms. These state that:

* Everyone can learn maths to the highest levels.
* Mistakes are valuable.
* Questions are really important.
* Maths is about connections and communication.
* Depth is more important than speed.
* Maths lessons are about learning not performing.

These positive norms are displayed in every classroom so the ideas become internalised by all staff and pupils.

Within this safe and inclusive learning culture, all children will be expected to engage in mathematical talk with their peers, through the use of structured conversations, maths buddy relationships, and questioning which is focussed on eliciting children’s ideas and understanding rather than obtaining the correct answers.

**Marking and Assessment**

Children will be provided with opportunities to self - mark throughout the maths lessons so they can self-monitor and identify both when they need challenge, or when they need support. Teachers/TAs will also live mark books as well as marking at the end of the lesson (see Marking and Feedback policy).

Children’s attainment and progress are recorded on Target Tracker termly.

Children complete White Rose End of Block assessments.

They all undertake a termly PUMA maths assessment.

Teachers independently access and analyze this data to ensure they are adjusting their planning to meet the needs of the individuals in their class. Teachers can draw on the knowledge and skills of their fellow teachers and the maths leadership team to help them address issues which are identified as a result of scrutiny of data.

Statutory assessments for mathematics take place at the end of KS1 (Year 2) and KS2 (Year 6). The Multiplication Tables Check takes place in Year 4.

**The Role of Support Staff**

It is acknowledged that children need to be taught primarily by their teacher and for this reason all children are included in the core maths lessons. Support staff will be directed by their teachers to support in a variety of ways and the school recognises that this will look different on different days and in different classrooms.

Support staff are provided with training to ensure their practice is aligned with the school’s values around the teaching of mathematics and their subject knowledge is up-to-date.

**Maths Homework**

Children in KS1 are set online maths homework using Numbots. In KS2 children receive tasks on MyMaths and they also all have a TT Rocktars account to practice fluency with multiplication tables. See appendix 1 for expectations with regards to TT Rockstars.

By:

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Appendix 1

**TT Rockstar expectations at The Laurels Primary School.** 

**Purpose**

The purpose of this document is to ensure that all staff have the knowledge and understanding of TT Rockstars to enable them to make best use of it as a teaching and learning tool. It is also intended to ensure parity of use across the school.

Key Points

* TT Rockstars should be used by all children in Years 3-6.
* It is a tool for retrieval practice in school and for homework. *It does not replace the teaching and learning experiences needed to secure an understanding of the concepts of multiplication and division. These experiences must continue through weekly maths lessons as per our long term planning.*
* Teachers should assess the children’s tables knowledge at the beginning of each half term using the paper format and the suggested recording system in the programme. I would however suggest that rather than the children calling out their scores as per the guidance (and possibly being shamed), this is done discretely by a TA/teacher collecting in and then inputting the scores.
* Children’s tables should be set according to their individual needs to ensure their practice sessions are targeted.
* Children must be provided with time weekly to practice their tables on TT Rockstars in school. Teachers can organise this in a way that best suits their timetable. Teachers must dictate how the children play in school for example they might be instructed to play in Garage so that they can review their own heatmap and self-assess.
* Teachers should look at their class' engagement with TT Rockstars on a weekly basis to enable them to identify children who are not using the programme and to problem solve with them how to increase their engagement.