**ROCKMOUNT PRIMARY SCHOOL**

**Big Maths Policy**

**Date: January 2023**

**Review Date: January 2024**

## Introduction

The school’s policy for mathematics is based on the Primary Maths National Curriculum 2014 document for the teaching of mathematics from Year 1 to Year 6 and the Early Years Foundation Stage (EYFS) curriculum.

## Rationale

Mathematics is a tool for everyday life. It is a whole network of concepts and relationships which provide a way of viewing and making sense of the world. It is used to analyse and communicate information and ideas and to tackle a range of practical tasks and real-life problems. It also provides the materials and means for creating new imaginative worlds to explore.

Essential characteristics we want to see in our pupils are:

* An understanding of the important concepts and an ability to make connections within mathematics.
* A broad range of skills in using and applying mathematics.
* Fluent knowledge and recall of number facts and the number system.
* The ability to show initiative in solving problems in a wide range of contexts, including the new or unusual.
* The ability to think independently and to persevere when faced with challenges, showing a confidence of success.
* The ability to embrace the value of learning from mistakes and false starts.
* The ability to reason, generalise and make sense of solutions.
* Fluency in performing written and mental calculations and mathematical techniques.
* A wide range of mathematical vocabulary.
* A commitment to and passion for the subject.

# Aims

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 nonroutine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions (National Curriculum 2014)

# Teaching Mathematics

All children in KS1 and KS2 participate in a daily mathematics lesson. The children in Early Years Foundation Stage (EYFS) will work towards their Early Learning Goals in line with EYFS curriculum. Our prime focus is to develop high levels of numerical understanding for all of our children. This is achieved by using the Big Maths approach to teaching number and ‘Little Big Maths’ for EYFS which is available to all classes, with online support.

**What is Big Maths?**

Big Maths is a systematic and structured approach to ensuring all children become numerate and then become fully rounded mathematicians. At the heart of this structure are the detailed sequences of learning through progress drives.

Big Maths ensures every child has a solid foundation of Core Knowledge before they start to use and apply it to wider mathematical concepts such as shape, fractions etc. Recognising the evidence of ‘Cognitive Load Theory’, Big Maths helps to manage the load and maintain balance between working and long-term memory.

Big Maths incorporates ‘Cognitive Load Theory’ research by:

* Providing children with success criteria for every step
* Applying secured knowledge to increasingly challenging contexts
* Recognising the ‘CLT’ models for explicit instruction.
* Incorporating the ability to teach through enquiry-based learning

At Rockmount Primary, through a consistent and logical progression in learning, we aim to equip our children with the mathematical knowledge and understanding that they will be able to use and apply in their everyday lives. We strive to ensure that all children have fluency in basic number knowledge and are able to apply reason and logic to problems.

Big Maths provides an accurate and simple, but highly effective, framework that guarantees progress. This framework, known as CLIC (Counting, Learn Its, It’s Nothing New and Calculation) is characterised by accurate steps of progression (Progress Drives) that make new learning easy by building on previous skills learnt. The CLIC resources provide progression at a glance as well as progression in detail. This ensures that all staff members teaching from the programme are following the same approach and therefore making learning clear for children. It also allows staff to fill in any gaps and to prevent future gaps from developing as all children make their way through the system with the necessary pre-requisite skills to meet new learning with further success and confidence.

Big Maths comes with a wealth of resources including jingles to help children learn their ‘Learn Its.’ [http://www.andrelleducation.com/product/big-maths-beat-that-challengejingles/](http://www.andrelleducation.com/product/big-maths-beat-that-challenge-jingles/)

**What is CLIC?**

A picture containing food, fruit

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**Counting** – This includes counting forwards and backwards in various increments, work on place value and reading and ordering numbers.

**Learn Its** – Learn Its are 72 number facts which are learnt throughout the years from Reception to Year 4. They are split across the different terms so that each class works on a few Learn Its at a time, to ensure they are fully embedded.

36 of the Learn Its are addition facts and 36 are multiplication facts; these are learnt in class and practised at home and are tested once a week in school through the ‘Big Maths Beat That!’ Challenge.

**It’s Nothing New** – Children use a bank of facts and methods that they already have, to solve problems. Each step of progress is very small; children will use and apply their skills and methods to a range of different situations and problems.

**Calculation** – This is often the main part of the maths lesson which focuses on teaching solid written and mental methods for addition, subtraction, multiplication and division. The children move through progress drives which introduce small, focused steps of progress throughout the year.

# Outer Numeracy

We follow an approach where we build on children’s ‘Core maths’ first so that they have the basic skills needed to be numerate. We call the rest of the mathematics curriculum ‘Outer Numeracy’.

**Real Life Maths**: (think ‘word problems’) These are worded scenarios that ask children to solve problems that attempt to mimic real life. For example, ‘There are 20 pencils in a box. 50 children need 2 pencils each. How many boxes are needed?’ All CLIC skills can be taken into real life context.

**SAFE Maths:** (think shape, measure, fractions and data) This refers to a large amount of primary mathematics curriculum content. Virtually all of SAFE Maths is underpinned by a Core Numeracy element. Shape - 2D, 3D, Coordinates etc. Amounts - Measures for distance, mass, angles etc. Fractions - Fractions of amounts, percentages, ratio etc. Explaining Data - Graphs, probability.

**Multi-Methods**: (think ‘Column Methods, Calculators and Cool Moves’) These refer to more efficient aspects of numeracy beyond the core. For example, one might teach children to add using near doubles, or to solve 405 – 198 by adding 2 to both numbers. This means the question is easily re-written as 407 – 200 and the gap between the two numbers becomes clearer. These methods also include Column Methods and solving calculations using a calculator.

**Dangerous Maths:** (think ‘number problems’) This means maths problems that take the child out of their immediate comfort zone and require more creative and analytical thinking. For example, ‘What is the highest square number under 1000?’ Dangerous Maths also includes algebra and number patterns. We just use the phrase ‘Dangerous Maths’ as teachers to remind us that children shouldn’t find this part of the maths curriculum easy.

**Reasoning and problem solving**

A key part of our maths curriculum at Rockmount is developing the children's ability to mathematically reason and solve a variety of problems. It is vital children are able to do this, as it shows that they have a deeper understanding of different concepts and that they are able to apply their basic knowledge and skills to a variety of situations. At Rockmount we encourage children to reason everyday – Most CLIC sessions end with a ‘Reasoning’ problem. We also use ‘Convince Me Cards’ to encourage reasoning and problem solving.

# Progression in Reasoning (Nrich)

* *Step one*: Describing: simply tells what they did.
* *Step two*: Explaining: offers some reasons for what they did. These may or may not be correct. The argument may yet not hang together coherently. This is the beginning of inductive reasoning.
* *Step three*: Convincing: confident that their chain of reasoning is right and may use words such as, ‘I reckon’ or ‘without doubt’. The underlying mathematical argument may or may not be accurate yet is likely to have more coherence and completeness than the explaining stage. This is called inductive reasoning.
* *Step four*: Proving: a watertight argument that is mathematically sound, often based on generalisations and underlying structure. This is also called deductive reasoning.
* *Step five*: Justifying: a correct logical argument that has a complete chain of reasoning to it and uses words such as ‘because’, ‘therefore’, ‘and so’, ‘that leads to’

# Planning

At Rockmount Primary School all teachers follow the ‘CLIC on your planning’ medium term planning (MTP) document which is available online and the school has copies of the document in the PPA room. This covers all aspects of CLIC. It shows all progress drives both new and revisited. Each 2nd half of every term the children will complete their ‘Outer’ maths in addition to their daily CLIC sessions.

# Assessment

Assessment for Learning (AfL) is a constant and ongoing process used by teachers to inform next steps in learning, to organise groupings for and during lessons and to actively adapt lessons to meet the needs of all learners.

We complete regular assessments as part of Big Maths weekly tests to identify learning gaps.

**‘Big Maths Beat That!’** – timed challenge where children answer ‘Learn Its’ questions. The aim is to beat their previous score.

**CLIC test** – 10 questions relating to concepts taught at children’s individual level throughout the daily CLIC lessons. Once they have achieved 10 out of 10, three weeks in a row, they move onto the next level.

**SAFE test**- 10 questions based on shape, amounts, fractions and statistics. Once they have achieved 10 out of 10, three weeks in a row, they move onto the next level.

# Cross Curricular Links

Mathematics should not be taught in isolation from other areas of learning. Opportunities to embed learning from mathematics lessons are planned in long-term, medium-term and short-term plans. Class teachers are encouraged to incorporate cross curricular teaching where appropriate. The subject leaders will work to raise the profile of maths in line with the School Development Plan through a wide range of ‘experiences’ such as whole school events, maths days and maths workshops.

# Differentiation

Teachers will include all pupils fully in their mathematics lessons. The tasks will be differentiated in a number of ways to ensure all pupils achieve their potential. Within each progress step the children will be taken through the ‘Making it Stick’ journey, starting from repeated practice questions, on to worded ‘real-life’ questions, finishing with deeper problem solving. This allows the teacher to continually challenge the more able children, hence allowing others to maintain pace, focusing on the core skill being taught.

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Intervention, targeted adult support and quality first teaching is used to ensure that all pupils make the best possible progress in mathematics.

## Monitoring and Evaluation

Monitoring the planning, teaching and assessment of Maths occurs termly to ensure adherence to the agreed maths policy as well as monitoring the quality of teaching and learning. Monitoring can also be used to fit in with the School Development Plan (where appropriate), through the collection of assessment data, book scrutinies, pupil conferencing, learning walks and observations. SLT and subject leaders can review progress via the Big Maths online overview section.

Opportunities for teachers to review planning, policy and published materials are given on a regular basis during staff meetings.

The maths link governor will also have the opportunity to meet with the maths subject leaders and attend training, staff meetings and joint lesson observations.

In line with school policy, the subject leaders will complete the ‘Subject Leader Annual Report’ every academic year for presentation to SLT and the Governing Body.

**Working Walls**

Every classroom from Reception to Year 6 should have a Maths Working Wall which should include:



* CLIC headings
* The current counting steps being taught or consolidated
* The current ‘Learn-Its’ displayed on fact family triangles with appropriate vocabulary statements displayed.
* It’s Nothing New section which shows connections
  + e.g. If I know 3 + 8 =11, I also know 11 – 3 = 8, 30 + 80 = 110, 30p plus 80p = £1.10 etc.
* The current calculation steps being taught
* The current progress drives being taught

# Big Maths Characters

At Rockmount Primary School, we have the Big Maths characters displayed in every classroom in Reception to Year 6 so that children can directly link their learning across their school life.

A picture containing food, light

Description automatically generated**Squiggleworth:** This character helps us to learn about partitioning numbers (he shows us what each ‘squiggle’ in a number is worth)

A picture containing drawing, food

Description automatically generated**Pim:** Pim is an alien from the planet CLIC. He has 3 arms on one side and 4 on the other. Children begin by knowing that 3 add 4 equals 7 and that this can be applied to all things. 3 things add 4 things always equals 7 things.

So PIM has 3 eyes and 4 eyes which equals 7 eyes.

He also has 3 legs and 4 legs which equals 7 legs.

This can then be applied further:

3 tens add 4 tens equals 7 tens (30 + 40 = 70).

3 hundreds add 4 hundreds equals 7 hundreds (300 + 400 = 700)

3 tenths add 4 tenths equals 7 tenths (0.3 + 0.4 = 0.7)

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**Pom:** Pom is Pim’s alien friend. Pom has several features that help children learn 4 key mathematical words: multiple, factor, square and prime

A person wearing a costume

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**Mully:** Meet ‘Mully Multiple’ He is known as Mully for short. Mully likes to explore and hide. He likes to hide behind the biggest multiple of a number he can find.

A screenshot of a cell phone

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**Count Fourways:** Count Fourways teaches children to count out loud in four ways. They count in 1s, 2s, 5s and 25s. It is not simply about being able to count in those multiples though and learning to count this way allows children to make links when reading scales, graphs and to develop their understanding of fractions.



**Speedy Col:** Speedy Col has lots of energy and loves to do things quickly. She’s not just fast but careful too. She likes everything done properly and is motivated to get the right answer. She is, therefore, AWESOME at Column Methods!

**Super FAB:** Super-FAB reminds children they are challenged to move along the FAB continuum and head towards a ‘brain only’ method. He is really good at focusing on holding numbers in his head, doing something else, and

then coming back to those numbers again.

**F -** Full: Using a full written method on high understanding.

**A** - Abridged: Writing is gradually replaced by memory

**B** - Brain: Finally, all calculation is done mentally.