CLIFFE V.C. PRIMARY SCHOOL
MATHS POLICY

Title	Author	Approved		Review Date
Maths Policy	AB / RR	Full Governing Body	**Date** July 2021	July 2023

CLIFFE VC PRIMARY SCHOOL'S MATHS POLICY IS BASED ON THE FOLLOWING PRINCIPLES:

Mathematics is important because:

- Mathematics is a life skill. It is an essential element of communication, widely used in society,both in everyday situations and in the world of work. "A high-quality mathematics education therefore provides a foundation for understanding the world, the ability to reason mathematically, an appreciation of the beauty and power of mathematics, and a sense of enjoyment and curiosity about the subject" (*National Curriculum 2014).*
- If taught correctly we can encourage children to develop a love for Mathematics.
- It is the method by which we make sense of space, number, and quantity within everyday life.
- Its mastery enables children to apply their knowledge in educational and real-life situations: logical reasoning, problem solving skills and the ability to think in abstract ways.
- It is essential for independence in many aspects of everyday life.
- It is a core subject in the National Curriculum.
- It is a compulsory examinable subject in national standardised tests.

AIMS:

Through the effective implementation of this policy, we strive to enable Cliffe mathematicians to:

- Become fluent in mathematical knowledge, concepts and skills.
- Have a deep understanding of mathematical concepts, processes and strategies and the ability to apply them in a mental, written, and problem-solving capacity.
- Communicate learning; solve problems, reason, think logically and to worksystematically and accurately.
- Show initiative and an ability to work both independently and in cooperation withothers.
- Have and use appropriate mathematical language
- Build resilience and respond to challenges by applying key skills already learnt.
- Use and apply mathematics across the curriculum
- Develop the ability to recognise mathematics in everyday situations and apply their mathematics to such situations.
- Have a positive attitude and interest in mathematics to raise confidence.
- Develop a healthy and enthusiastic attitude towards Mathematics that will stay with them to encourage economic wellbeing.
- Show an understanding of mathematics through a process of enquiry and experiment.
- Improve their mental recall of number facts.
- Improve their skills in mental calculations by ensuring that they have a repertoire of strategies to draw upon.

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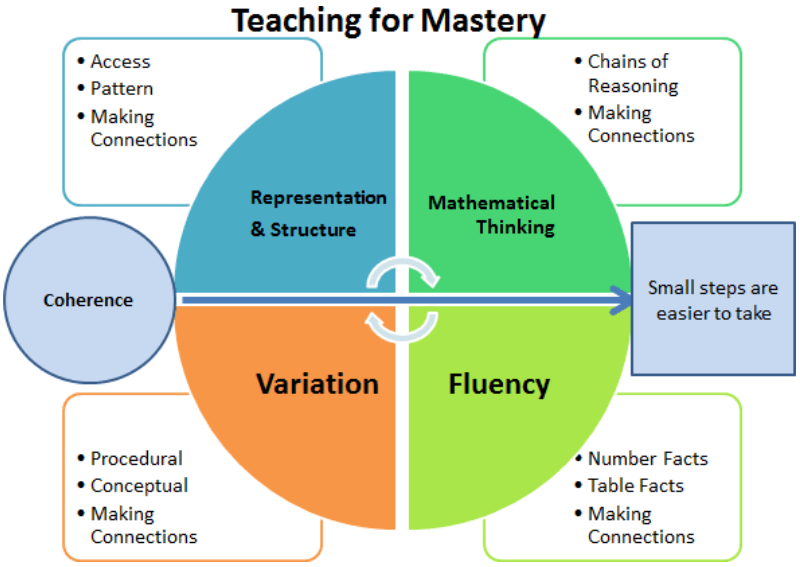
INTENT:

- Curriculum coverage throughout school will be based upon that prescribed by 'The Early Years Foundation Stage (EYFS) Statutory Framework' and the 'The National Curriculum - Mathematics programmes of study: key stages 1 and 2'.
- Curriculum objectives for Mathematics will be reflected within individual class annual plans and teachers short term lesson planning. In all plans there should be carefulconsideration for activities which are well matched to the range of abilities within the class / group.
- Individual class annual plans for Mathematics will give note to the following;
  - Curriculum Coverage
  - Rational
  - Pedagogy
  - Enhancements / cross curricular learning
  - Skills developed (transferable)
  - Knowledge acquired (Subject specific)
  - Vocabulary learnt

- By the time children leave our school we intend all children will be fluent, be able to reason and problem solve. Our maths curriculum follows a Teaching for Mastery Approach. By adopting a 'mastery approach' to the teaching and learning of Maths, informed by White Rose, we are offering our pupils the best possible start on their number journey. At the centre of our maths vision is the belief that all children have the potential to succeed. We believe that all children, where possible, should have access to the same curriculum content and should deepen their conceptual understanding by tackling challenging and varied problems.

The principles of a Teaching for Mastery Approach are:



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Coherence	Representation and Structure	Mathematical Thinking	Fluency
Lessons are broken down into small connected steps that gradually unfold the concept, providing access for all children and leading to a general understanding of the concept and the ability to apply the concept to arange of contexts.	Representations used in lessons expose the mathematical structure being taught, the aim being that students can do the maths without recourse to the representation.	If taught ideas are to be understood deeply, they must not merely be passively received but must be worked on by the student: thought about, reasoned and discussed with others.	Quick and efficient recallof facts and procedures and the flexibility to move between differentcontexts and representations of mathematics

Variation
Variation is twofold. It is firstly about how the teacher represents the concept being taught, often in more than one way, to draw attention to critical aspects, and to develop deep and holistic understanding. It is also about the sequencing of the episodes, activities and exercises used within a lesson and follow up practice, paying attention to what is kept the same and what changes, to connect the mathematics and draw attention to mathematical relationships and structure.

The National Curriculum (2014) 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.
- 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-routineproblems with increasing sophistication, including breaking down problems into a series ofsimpler steps and persevering in seeking solutions.

- Our intent focuses on equipping all pupils with the mathematics they need to master the curriculum for each year group, which requires that all pupils:
  - Recall key number facts with speed and accuracy and use them to calculate and work out unknown facts;
  - Develop their ability to apply mathematical skills with confidence and understanding when solving problems.
  - Apply 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
  - Express themselves and their ideas using the language of mathematics with assurance.
  - Have sufficient depth of knowledge and understanding to reason and explain
  - Mathematical concepts and procedures and use them to solve a variety of problems.
  - Develop positive attitudes to mathematics, recognising that mathematics can be both useful and enjoyable.
  - Nurture a fascination and excitement of mathematics
  - Are able to use and apply the skills in other curricular areas.

- Our expectation is that the majority of pupils will move through the programmes of study at broadly the same pace. However, decisions about when to progress should always be based on the security of the pupil's understanding and their readiness to progress to the next stage.
- Pupils who grasp concepts rapidly should be challenged through being offered rich and sophisticated problems before any acceleration through new content.
- Those children who are not sufficiently fluent with earlier materials should consolidate their understanding, including through additional practice, before moving o

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IMPLEMENTATION:

Organisation

- In EYFS pupils experience mathematics on a daily basis, through teacher-directed tasks and child-initiated play. Opportunities for mathematics should be developed through daily routines and all areas of learning.
- A daily mathematics lesson is typically taught in every class, from Year 1 upwards.
- Such lessons are typically of 45-60 minutes is taught in Key Stage 1 and may go above 60 minutes in Key Stage 2.
- Some children in ks2 will also be given the opportunity to consolidate and apply their mathematical knowledge through use of the 'Doodle Maths' app. This will occur as seen appropriate by the Class Teacher and typically happen outside of the standard Maths lesson.
- Pupils are taught within their classrooms and within their normal class groups, by their regular Class Teacher.
- A typical 45- 60 minute lesson will likely include:

Lesson Phase		Outline
Early work (as children enter school in the morning)		Consolidation of key concepts/misconceptions highlighted by the class teacher in maths are used as early work on some days of the week. Doodle Maths intervention programmes might also be used.
Lesson structure	Maths Starter activity	Recap of prior learning from last week, term, year etc. The purpose of this activity is to promote fluency of arithmetic and the 'Non-negotiable' aspects of mathematics. The starter activity is up to 15 minutes and resources can include, but are not limited to: Fluent in 5 or 10/Number talk/arithmetic practice/ Flashback 4 activity from White Rose/TT practice. This supports retention.
	Review	At the beginning of each lesson, a review may take place toaddress any whole class misconceptions from the previous lesson or re-visit prior learning to set the scene for the lesson
	Introduce new learning	White Rose planning small steps During this time teachers gather pupil's ideas for solutions and the class discuss them as a whole group. During this time, new concepts are then introduced using a CPA approach. Guided examples are provided for reinforcement. This learning may take place on a mini whiteboard
	Magic 5 Fluency	Comprises questions for further consolidation and for the immediate evaluation of pupil's learning - 5 questions in children's maths books Questions are typified by their mathematical variation- they are designed to extend pupil's thinking rather than just being lots of examples presented in the same kind of way.
	Reasoning/problem solving	At Cliffe, we believe all students should have opportunities to develop reasoning and solve problems as well as develop fluency. Differentiation can be achieved, for example, through varying the degree of support provided, using enabling and extending questions, and providing or asking for alternative representations. During this phase, stem sentences will be used to allow learners to verbalise their mathematical thinking. Pupils work through well-structured exercises which consolidate the concepts, problem solving andreasoning which has taken place in the lesson. We vary the level of challenge in our reasoning and problem-solving questions so that some are accessible to every child while others help to stretch thinking and deepen understanding. Depending on pupil's own self-assessment, in consultation with the teachers, they will be able to choose to challenge themselves.

- Assessment for learning will go on throughout the session, this may involve;
  - Work with the whole class to refer back to Learning Objective and/or Success Criteria.
  - Address misconceptions.
  - Identify progress.
  - Summarising key facts and ideas.
  - Clarifying what needs to be remembered.
  - Making links to other work.
  - To discuss next steps in learning.

Teaching strategies

- In order to provide the children with active and stimulating learning experiences, a variety of teaching and learning opportunities are adopted:-
  - Children may work individually on a task, in pairs or in a small group, depending on the nature of the activity.
  - Wherever possible, practical 'real' activities are used to introduce concepts and reinforce learning objectives.
  - Opportunities to transfer skills learnt, to real situations, are used whenever possible.
  - Activities are planned to encourage the full and active participation of all pupils.
  - Teachers use carefully planned questions throughout the lesson in order to meet the needs of all abilities.
  - Self-differentiation is used regularly in order for children to challenge themselves.
  - A 'Concrete / Pictorial / Abstract' approach is utilised in all year groups, all classes have access to a range of mathematical manipulatives to support learning and understanding. A CPA calculation is followed by all year groups. At Cliffe, all teachers follow the White Rose Planning. For calculation, Cliffe's calculation Policy, which follows our Mastery Approach, should be adhered to and relevant calculations/methods are displayed in the classroom to support learning.
  - Teachers place a strong emphasis on correct use of mathematical language; this is supported by key vocabulary being displayed.
  - Stem sentences are used and modelled during whole class input.
  - Teachers value pupils' oral contributions and create an ethos in which all children feel they can contribute.
  - Throughout the school, children learn number facts and times tables using exciting videos and songs, alongside NumBots, Doodle Maths and Doodle Tables.
  - Whole school displays are used to encourage children to learn and recall rapidly facts which will support their maths learning.
  - Each class will engage in 'Active Maths' activities a minimum of once per week. This may be within a standard Maths session or as an additional activity.
  - Reasoning and problem solving skills are taught explicitly by teachers as part of maths lessons in order to model the use of correct mathematical vocabulary and written reasoning.

Environment

- It is important that both the whole school and classroom environment supports both the learning and teaching of mathematics. The school aims to provide a mathematically stimulating environment:
  - Through the use of working walls to support learning and teaching in a lesson or series of lessons.
  - Through interactive displays that promote mathematical thinking and discussion
  - Through displays of pupils' work that celebrate achievement, including WAGOLLs ('What a good one looks like').
  - By providing a good range of resources and manipulatives for teacher and pupil use.
  - In every classroom, resources such as number lines, hundred squares, place value counters, double-sided counters, place value charts and multiplication squares are displayed as appropriate and used for whole class or individual work. Children are encouraged to access these independently.

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Curriculum Planning

- Long Term Planning
  - Teachers will use the White Rose Maths Long Term planning supplementing this with additional resources as necessary. All mathematical topics will be taught in blocks so that children can master each mathematical concept and apply it across a range of contexts.
  - The White Rose Maths approach focuses on reinforcing number competency, whilst providing opportunities to build reasoning and problem solving into each lesson, and encourages each student to build confidence and resilience to achieve in maths.
  - For the year 2020-2021, teachers and their SLT will adapt the Long-term planning in light of school closures, depending on any topics which were missed or covered during home learning.

- Medium Term Planning
  - Teachers will use the planning produced by the White Rose Maths Hub.
  - These medium term plans use the National Curriculum to teach sequences that build learning over time.
  - The emphasis is to develop a sequence of teaching and learning that encompasses the cycle of assess, plan, teach, practise, apply, and review through every unit.
  - A strong emphasis on Using and Applying including reasoning in mathematics is embedded within the curriculum.
  - Cross curricular mathematics links are planned where possible, utilising the wider topic medium term plans. The reinforcement of mathematical skills and knowledge across all subjects is implemented where appropriate to highlight its importance and relevance in education and with a view to everyday life.
  - In light of recent school closures, where applicable missed learning will be taught through the wider curriculum, including: geometry, measures, and statistics.
  - In light of school closures, White Rose Maths added 'Recap steps' to recap essential content that children may have forgotten/missed. These are highlighted on the 'lesson by lesson overviews for 2020-2021'. None of the content has been deleted, recap has just been added so teachers can use their professional judgement whether a recap is needed and how long for.
  - White Rose small steps and recap sessions are linked to the 'Ready to Progress' document (2020) which were devised to highlight core concepts in the national curriculum and demonstrating progression from year 1 to year 6. RtP document summarises the most important knowledge and understanding within each year group and important connections between these mathematical topics. It is important and valuable for teachers to take note of these when considering gaps in knowledge as a result of school closures so that all children at Cliffe are ready to progress to their next stage of school life.

- Short Term Planning

  - All teachers will largely follow the small steps and lesson by lesson overviews provided by White Rose.
  - These will likely include an outline for the week with learning objectives, outline activities for the maths starter (for example, making using of the Fluent in 5 resources or a Number Talk), whole class teaching focus, reasoning, problem solving, self- differentiation, key questions, and opportunities for Assessment for Learning and key vocabulary.
  - These will be amended and updated based on assessment for learning and the needs of the class.
  - Teachers evaluate their planning on a daily basis, making any necessary changes to provide additional input, challenges etc.
  - Teachers may also plan for a regular pre-teaching session for identified children and how they will assign competence within their maths lesson.

Planning may be monitored by the Headteacher, maths subject leader and Governors as deemed necessary.

Homework

- We recognise the importance of making links between home and school and encourage parental involvement with the learning of mathematics.
- Homework provides opportunities for children
  - To practise and consolidate their skills and knowledge of mental arithmetic methods;
  - To share their mathematical work with their family;
  - To prepare for their future learning.

See Home Working policy for further details.

IMPACT

Assessment, recording and reporting (please see Assessment policy)

- Assessment takes place in three connected ways: ongoing assessment, self-assessment and summative. These assessments are used to inform teaching in a continuous cycle of planning, teaching and assessment.
- Ongoing Assessments
  - As part of the ongoing teaching and learning process, teachers will assess children's understanding, achievement and progress in mathematics within the lesson itself.
  - Daily annotations, which inform day to day teaching and learning, are based on observation, questioning, informal testing and the marking and evaluation of work.
  - This will also enable appropriate feedback to children and TA planning for the following day.
  - Teachers will make use of diagnostic questioning at different stages of pupil's learning, including prior to a unit beginning to identify misconceptions, during a unit of work to check these have been addressed and also at the end.
  - Anchor tasks will also be utilised to enable teachers to observe children's responses and to prompt further exploration with questioning.
  - Any children who have not met the learning objective will be identified and provision for them tailored before or during subsequent lessons.

See Feedback and Marking policy for further details.

- Self Assessment
  - Learners will also be taught to assess and evaluate their own achievements by recognising successes, learning from their own mistakes and identifying areas for improvement.
  - Pupils will be involved in self and peer marking as felt appropriate by the Class Teacher.
  - Pupils will be given time to reflect and act upon either written or verbal feedback from the class staff, either to correct mistakes or further their learning.

- Summative Assessments
  - Summative assessments will be carried out towards the end of each term. Formal PUMA written assessment tests will be used in order to assess and review pupils' progress and attainment. This enables attainment to be tracked and will inform provision maps and planning. Gap analysis will be carried out and used to inform planning.

EQUAL OPPORTUNITIES :

- All pupils will have equal opportunity to reach their full potential across the mathematics curriculum regardless of their race, gender, cultural background, ability or physical disability.

INCLUSION :

- The school's equal opportunities policy applies to the teaching of mathematics as to all other subjects.