Escomb Primary School

Mathematics Policy 2021

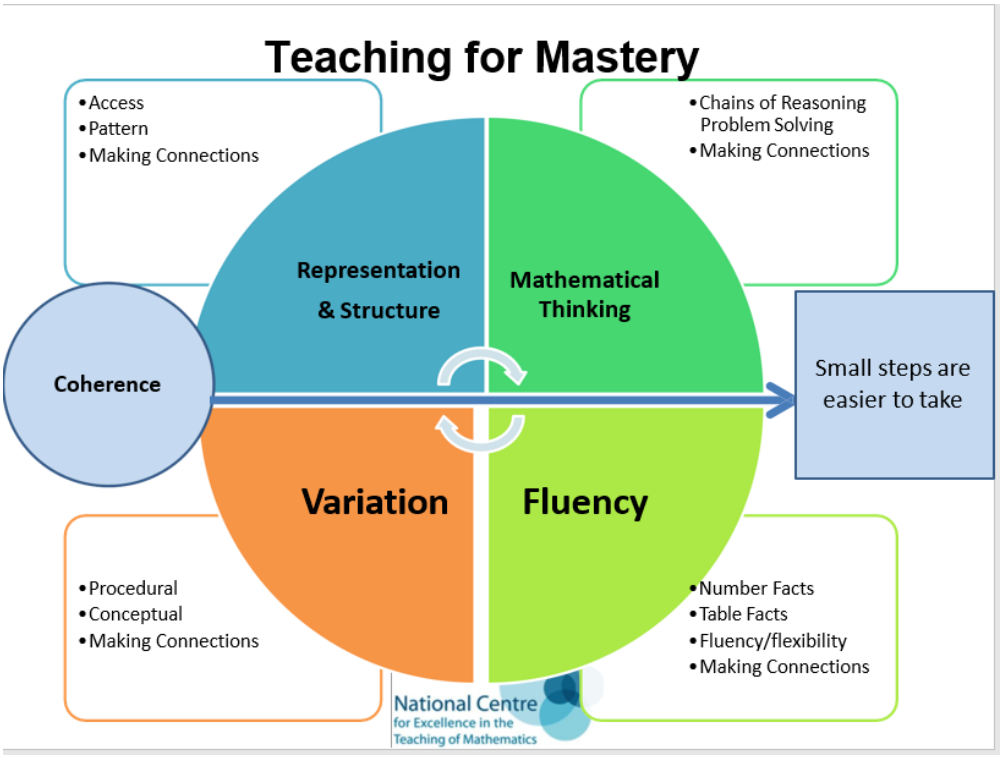
Introduction

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).

Intent

Our staff have high expectations of all children and encourage them to be successful and achieve their full potential using a mastery approach to mathematics. All children will be fluent, be able to reason and problem solve. Our maths curriculum follows elements of a Teaching for Mastery Approach. At the centre of our maths vision is the belief that all children have the potential to succeed. Whilst due to Covid-19, we will begin our maths topics throughout the year with a review of the previous year's 'ready to progress' objectives, 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 teaching for mastery are:



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 generalization of the concept and the ability to apply the concept to a range 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 other.	Quick and efficient recall of facts and procedures and the flexibility to move between different contexts 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-routine problems with increasing sophistication, including breaking down problems into a series of simpler 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 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 mathematics 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 curriculum areas.

Our expectation is that the majority of pupils will move through the programme 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 accelerated through new content. Those children who are not sufficiently fluent with earlier materials should consolidate their understanding, including through additional practice, before moving on.

Implementation

- In EYFS pupils experience mathematics on a daily basis, through teacher directed tasks and child-initiated play. Opportunities foe mathematics should be developed through daily routines and all areas of learning.
- A daily maths lesson is taught in Years 1 – 6. Children will practice recalling number facts to improve speed and accuracy for 10 minutes at least 3 times a week.
- Each lesson may include: starter activity, review of previous teaching/concepts, main teaching of concepts, using stem sentences, children's whole class learning, children's independent learning / group supported by adult, challenge.
- The skills acquired in maths lessons are applied across the curriculum.

Teaching strategies

In order to provide 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 enhance 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.
- All classes will have access to a range of mathematical manipulatives to support learning and understanding.
- 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. Whole school displays are used to encourage children to learn and recall rapidly facts which will support their maths learning.
- 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.

Curriculum Planning

Long Term Planning

Teachers will use long term planning based on White Rose Maths. All mathematical topics will be taught in blocks so that children can master each mathematical concept and apply it across a range of contexts.

For the year 2020-2021, teachers 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 medium term planning based on White Rose Maths. 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. For the academic year 2020-2021, 'ready to progress' objectives from the previous year group will be assessed prior to moving onto the current year group objective. This will be achieved through formative assessment throughout the lesson. The DfE

document "Teaching Mathematics in Primary Schools" https://www.gov.uk/government/publications/teachingmathematics-in-primary-schools will support this process, as it identifies priority areas of the primary maths National Curriculum that form the essential building blocks necessary for pupils to progress smoothly from Year 1 to Year 6. For each of these areas, the document also identifies what it calls 'ready-to-progress criteria' which are the concepts children need to master before they progress to the next year group. The White Rose planning resources are able to support as they have identified where teachers might want to spend longer on topics to secure understanding and also suggest any content that children may have missed last year. NCETM progression may also to be used to support at the stage of planning.

Cross curricular mathematics links are planned for using the topic medium term plan. In light of recent school closures, where applicable missed learning will be taught through the wider curriculum, including: geometry, measures, and statistics.

Short term planning

Teachers will use and adapt short term planning based on White Rose Maths. Planning will include an outline for the week with learning objectives, outline activities for the maths starter, whole class teaching focus. These will be amended and updated based on assessment for learning and the needs of the class. Teachers will also provide a TA 'assessment for learning' planning which will be updated daily based on the assessments. Teachers evaluate their lessons daily, making any necessary changes to provide additional input, challenges etc. Teachers will also plan for a regular pre/post-teaching session for identified children and how they will assign competence within their maths lesson.

Impact

Assessment, recording and reporting (please see Assessment policy)

Assessment takes place at three connected levels: short-term, medium-term and long-term. These assessments are used to inform teaching in a continuous cycle of planning, teaching and assessment.

Day-to-day assessments

As part of the ongoing teaching and learning process, teachers will assess children's understanding, achievement and progress in mathematics. The marking of mathematics work follows the whole school marking policy and consists of both verbal and written feedback. Daily annotations, which inform day to day teaching and learning, are based

on observation, questioning 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. Any children who have not met the learning objective, will be identified with a clear idea of how the child's needs will be met in a pre/post intervention or during the next lesson.

In the Foundation Stage, progress across the year is assessed against the Developmental Matters and Early Learning Goals of the Early Years Foundation Stage Curriculum. A final judgement is made in the Summer Term as part of the Foundation Stage Profile. Assessments are based on observations of child-led activities and through adult focussed activities.

Summative assessments

Gap analysis will be carried out and used to inform planning. Summative assessments will be carried out throughout the year using NFER tests. White Rose end of term assessments can be used by the class teacher for those children who are ready in order to assess and review pupils' progress and attainment. This enables attainment to be tracked and will inform planning.

Intervention programmes

The school operates a flexible approach to intervention programmes based on weaknesses identified in formative and summative assessments and through ongoing data analysis by the senior leadership. Teachers use guided groups led by themselves and teaching assistants to tackle children's misconceptions in maths.

Greater Depth Pupils

Pupils demonstrate high ability in mathematics in a range of ways and at varying points in their development. Pupils who are gifted in mathematics are likely to:

- learn and understand mathematical ideas quickly;
- work systematically and accurately;
- be more analytical;
- think logically and see mathematical relationships;
- make connections between the concepts they have learned;
- find rules and identity and explain patterns easily;
- be able to visualise, imagine and explain properties of shape quickly;
- be able to apply their knowledge to new or unfamiliar contexts;
- communicate their reasoning and justify their methods;
- ask questions that show clear understand of, and curiosity about, mathematics;
- challenge or questions mathematical rules;

- prove/disprove rules/generalisations based on mathematical evidence;
- create algebraic rules based on sequences and patterns;
- take a creative approach to solving mathematical problems;
- sustain their concentration throughout longer tasks and persist in seeking solutions, absorbed in their work;
- be more adept at posing their own questions and perusing lines of enquiry;
- have an ability to work calculations/problems out in their head very quickly;
- be able to relate their understanding of maths to areas such risk and uncertainty;
- verbally articulate their strategies, findings, observations with peers/adults;
- apply mathematics to different contexts and environments;
- apply their mathematics to both routine and non-routine problems easily.

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.

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.
- 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.

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. Children in Years 1-6 receive a short piece of mathematics homework each week.

The content of homework activities are decided by individual class teachers based on their children's needs. (See Homework policy for further details).

Reporting to Parents

Each term progress and attitude sheets are given to parents at consultation evenings for discussion. Teachers use the information gathered from their observations and assessments to help them comment on individual children's progress.

Monitoring and Evaluation

The mathematics leader is responsible in monitoring and evaluating the quality and standards of mathematics throughout the school and enables the leader to support teachers with mathematics.

Resources

Resources which are not used or required regularly are stored centrally and accessed by teachers as needed. Other resources are stored within the classrooms and are easily accessible to all children, allowing them to become familiar with the relevant equipment.

Role of the Subject Leader

- To take the lead in policy development
- To support colleagues.
- To monitor progress in Mathematics – eg leading staff CPD, scrutiny of work, analysis of formal assessment data.
- To take responsibility for the choice, purchase and organisation of central resources for Mathematics, in consultation with colleagues.
- To liaise with other members of staff to form a coherent and progressive scheme of work which ensures both experience of, and capability in, Mathematics.
- To be familiar with current thinking concerning the teaching of Mathematics, and to disseminate information to colleagues.
- The subject leader will be responsible to the Headteacher and will liaise with the named link Governor.

This policy will be reviewed by the governors annually.