



Treloweth Primary School

MATHEMATICS POLICY

	Signature	Date
Governor with responsibility	Mr M. Nedeljkovic	January 2023
Chair of Governors	Mrs K Monk	January 2023
Headteacher	Mrs L May	January 2023
Review date: January 2024		

‘Without mathematics, there’s nothing you can do. Everything around you is mathematics. Everything around you is numbers’.

Shakuntala Devi

Mathematics is a creative and highly interconnected 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 for financial literacy and most forms of employment. 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.

Our Intent

Treloweth School aims to provide pupils with a robust and coherent mathematical journey, rooted in the delivery of a high-quality curriculum, taught by highly skilled practitioners to produce competent, mathematically minded individuals who are numerate, creative, independent, inquisitive, enquiring and confident.

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 non-routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions
- have the confidence to approach challenges and broaden their own understanding through a learner led, independent approach.

Through our maths teaching, we strive for all of our pupils to become fluent in the key concepts underpinning number and to develop their mathematical reasoning by recognising relationships, making generalisations and proving their thinking using a range of appropriate mathematical vocabulary. In addition to this, we aim to give our pupils the confidence to solve mathematical problems using a range of strategies. Treloweth School believes that mathematics is an interconnected subject in which pupils need to be equipped with the skills to move between representations of mathematical ideas and concepts. The programmes of study are organised into apparently distinct domains, but our ambition is to facilitate every pupil's ability to make rich connections across mathematical ideas to develop competence when solving increasingly sophisticated problems. It is our purpose to ensure that pupils are taught how to apply their mathematical knowledge and skills in a range of contexts and subjects to enhance their understanding of the wider Treloweth Curriculum. Mathematics enables understanding of the world, which is why it has become an integral part of our Treloweth Curriculum as we aim to ensure that positive attitudes toward mathematics are fostered and that pupils gain enjoyment in the subject through a growing self- confidence in their ability.

Our expectation is that the majority of pupils will move through the small steps at broadly the same pace. However, decisions about when to progress should always be based on the security of pupils' understanding and their readiness to progress to the next stage. Pupils who grasp concepts rapidly ('rapid graspers') should be challenged through being offered rich and sophisticated problems and carefully planned, high order questioning, before any acceleration through new content. Those who are not sufficiently fluent with earlier material should consolidate their understanding through varied, bespoke additional practice.

We believe that foundational knowledge, particularly proficiency in number, give pupils the ability to progress through the curriculum at increasing rates later on, therefore we diligently focus on the core knowledge early on in a pupils journey at our school.

Equal opportunities

Teachers ensure that all pupils have equal access to the full mathematics curriculum at Treloweth School.

THE TRELOWETH MATHEMATICS CURRICULUM

In KS1 and KS2 we use the NCETM Curriculum as the basis of our mathematics teaching and the small step learning intentions within it to ensure complete coverage of all aspects of mathematics. To supplement this, we use the DfE mathematical guidance, White Rose, Maths Whizz and the Mastering Number programme to guide our children through their mathematical journey from EYFS to Y6. These documents support the immersion of all children in mathematics from the day they join our school and ensure that over time, children develop their competence in mathematics. At Treloweth we pride ourselves on fostering every child's ability to:

- have automaticity with number facts, such as number facts and multiplication facts
- have declarative, procedural and conditional knowledge embedded
- calculate accurately and efficiently, both mentally and in written form
- competently use manipulatives and representations to access challenges
- make sense of problems, including non-routine 'real' problems
- develop spatial awareness and an understanding of geometry, statistics and measure.

At Treloweth, we use our comprehensive 'Treloweth Mathematics Curriculum' intention document developed using the NCETM materials to inform our teaching and learning. This provides teachers with a clear overview of what the children learn at each stage of their mathematical journey. This document also supplements teacher's subject knowledge with signposts to the NCETM PD materials, enabling them to create informed planning by providing precise vocabulary, key questioning, stem sentences and links to Ready to Progress PowerPoints and Numberblock episodes. In addition, this allows for effective recapping and reactivating of prior knowledge and skills and outlines the essential ingredients for our mathematics teaching and learning. We then use NCETM small step progression materials which ensures our teaching is progressive and provides teachers with the opportunity to develop links, encourage thinking and embed deep mathematical understanding.

Depth of Learning

Depth of learning is a fundamental principle to our mathematics teaching at Treloweth. All children explore mathematical challenges through a range of experiences; using manipulatives, representations and visual prompts to scaffold their understanding of mathematical ideas. Through careful planning and preparation and using our agreed 'S plan', we ensure that throughout the school, all children are given opportunities for:

- daily practice of basic written and mental arithmetic to ensure automaticity of number facts
- problem solving across the curriculum and real life links in every lesson
- frequent opportunities for paired, group and whole class discussions
- open and closed tasks, providing opportunity to investigate mathematical concepts
- exploration of a range of manipulatives and representations
- development of conceptual understanding and exploration of complex problems
- daily challenge through carefully planned variation.

We use consistent manipulatives and representations in all year groups as a useful tool to support children's deep acquisition of concepts and representations in mathematics and understand the importance of moving the children from these to more visual and written recordings at the earliest possible opportunity so that they can begin to independently internalise key mathematical ideas. We use the DfE Maths guidance documents [Maths guidance introduction \(publishing.service.gov.uk\)](https://publishing.service.gov.uk/guidance/6451663) to further support this.

MATHEMATICS TO SUPPORT UNDERSTANDING OF THE WIDER CURRICULUM

Throughout the whole curriculum, opportunities are planned to teach, extend and promote rich understanding of mathematics through our core themes- Sense of Identity, Sense of Place and Sense of Adventure. Our Treloweth Maths Application Road Map outlines how we apply our maths skills to further develop our appreciation of and knowledge in other subjects. How this supports our wider curriculum in detail can be seen in the long term curriculum overviews.

TEACHERS' PLANNING AND ORGANISATION

The approach to the teaching of mathematics within Treloweth School is based on five key principles:

- ❖ a one hour daily mathematics lesson to focus on the core curriculum: place value, number, calculations and GSM
- ❖ small step learning which builds on children's prior knowledge and skills
- ❖ a clear focus on expert direct, instructional teaching and interactive oral work with the whole class and mixed ability pairs
- ❖ an emphasis on developing and strengthening mental calculation, through practice and application opportunities
- ❖ a commitment to embedding the mastery approach, whereby all children have access to and experience of, first quality teaching of their year group's learning intentions and daily challenge (Greater Depth Mastery Challenges- GDMCs).

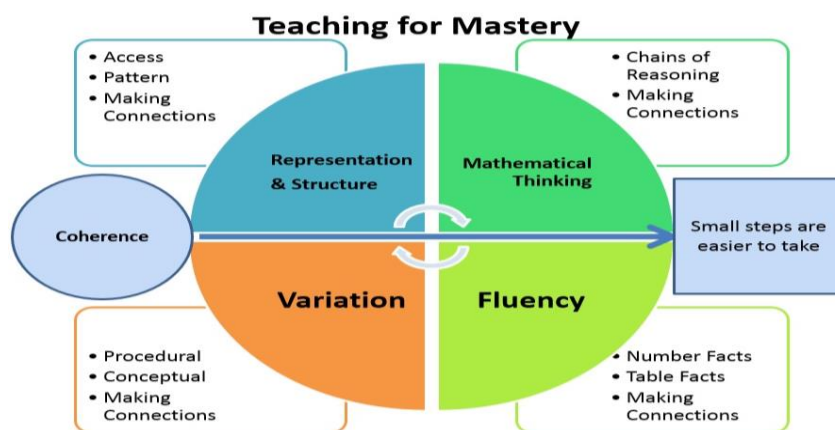


Fig. 1

Teachers deliver our Treloweth small step maths curriculum to ensure development of children's learning takes place over time and that the learning intentions are covered systematically. Teachers' planning is guided by the high quality NCETM Curriculum planning documents and informed by the NCETM professional development materials. Lessons are planned on PowerPoint slides using our agreed 'S plan' components (Appendix 1). Content coverage is revisited over time and focused on the 'need to know' declarative and procedural knowledge (Fig. 2). Planning scrutiny, and lesson visits are carried out termly by the mathematics lead to ensure coherence and high expectations are maintained across the whole school.



Fig. 2

Teachers in EYFS classes base their teaching on objectives in the 'Curriculum Guidance for the Foundation Stage;' this ensures that they are working towards the 'Early Learning Goals for Mathematics'. The children are given access to daily mathematical challenges through continuous provision and in addition, participate in adult led mathematics sessions in preparation for Year One. Mastering Number is used daily and Power Maths booklets and Number Blocks are used to enhance this and children record in books. In addition to this, 'Numbersense' is used to give children an excellent early understanding of number.

SEND

All pupils have access to high quality first teaching and those pupils with special educational needs may receive additional support through:

- Additional teaching time both in and outside the classroom (post/ pre teach);
- Carefully targeted and planned intervention include- the 'Ready to Progress' (NCETM) materials in KS1 and KS2; Power Maths textbooks/ White Rose materials for children with individual needs to meet and extend the learning at their level.
- Learning through the 'Number Sense' programme of workbooks, guided by a skilled teaching assistant or teacher;
- Additional practice/ overlearning opportunities provided by teaching assistants and teachers.

ASSESSMENT AND RECORD KEEPING

Using the 2014 curriculum materials, teachers are expected to make regular assessments of each child's progress and to record these systematically. Daily notes are made on NTS ('Note To Self' sheets), ensuring that children who have found a concept of idea challenging are noted and their learning needs addressed through the same day targeted intervention. All assessment data is used to inform planning and identify and address any misconceptions. Assessment in mathematics is formative and summative and allows the maths lead to track each child's learning journey termly, throughout their time at Treloweth School, ensuring that all pupils acquire the 'need to know' concepts and mathematical principles.

Formative assessments

Teachers use a range of formative pedagogical assessment techniques daily, making careful observations of children's mathematical acquisition to ensure mastery of each idea and concept is achieved by all. Same day intervention (Post Teach) is planned for using NTS sheets for children who need to spend more time on a concept to master it efficiently, this is evident in children's books. Teachers are encouraged to develop their children's understanding of a particular concept using a variation approach, for example using empty box calculations or looking at number patterns in a variety of ways, this ensures that rich understanding takes place and ensures that assessment is specific, accurate and individualised. Children are assessed on how deeply they have grasped a mathematical idea. Pupil progress meetings are held every term with the maths lead to discuss the progress of all children in the school. These are to ensure that all needs are being met and to make adjustments and refine provision to enhance teaching and learning for individuals, groups and cohorts.

Summative assessment

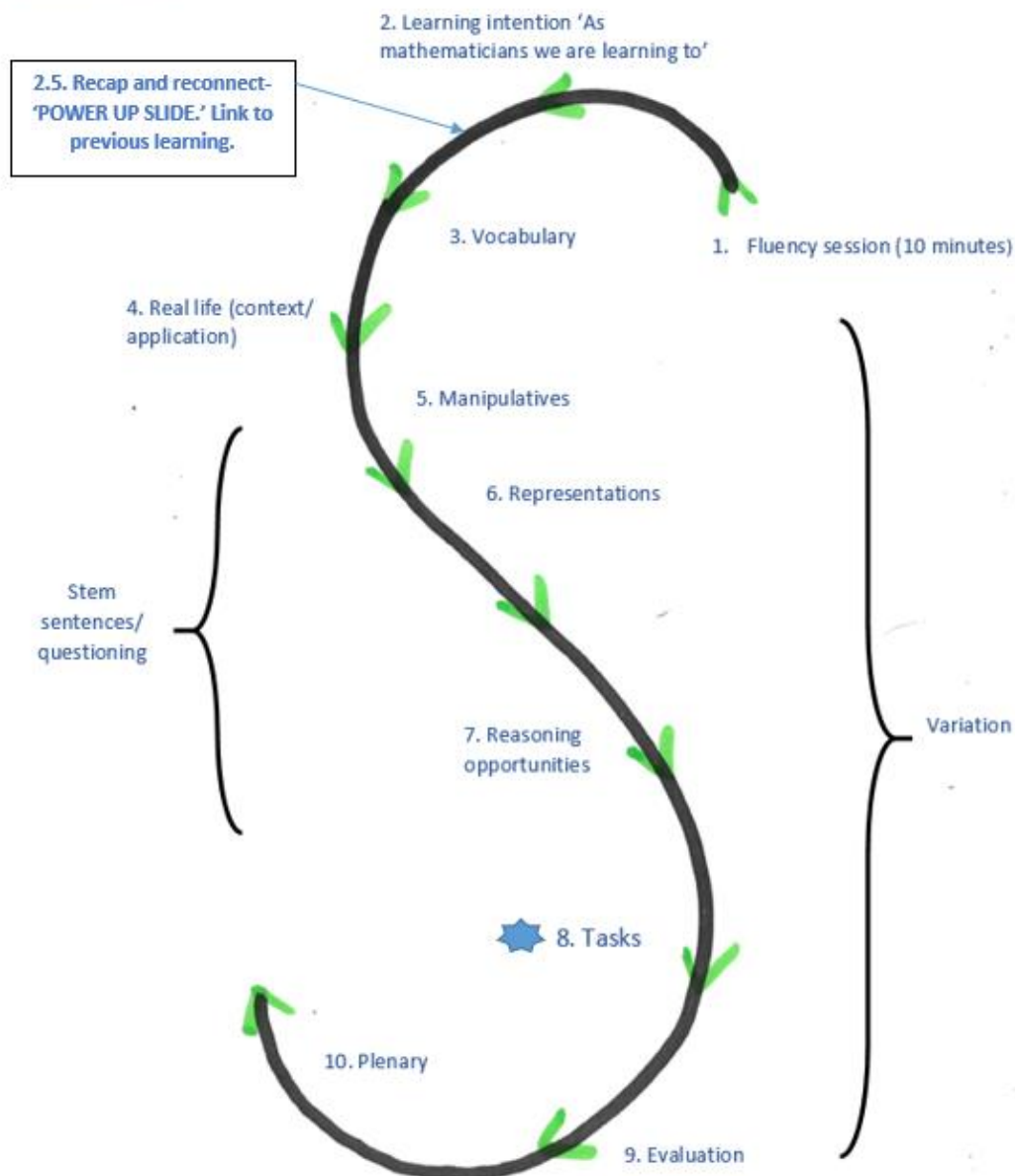
At the end of each term, PUMA tests are administered to all children from Y1-Y6 to support teachers' judgement of the mathematical level of each child. Gap analysis is carried out by individual teachers and they work with the maths lead to identify misconceptions, misunderstandings or common errors, which then feeds into future teaching. This data is recorded on SONAR by the class teacher and analysed by the mathematics coordinator to ensure that the progression of each child is rapid and that the expected progress is being met in each cohort. In addition to this Maths Whizz data is regularly looked at to identify gaps and further inform teaching. Children carry out National end of key stage assessments in Year 2 and Year 6 and participate in the 'Multiplication Check' in Year 4.

We believe that by using an informed mastery approach and embedding the five key ideas (Fig. 1) we will give every child in our care the opportunity to reach their full potential. Through providing children with small step, coherent lessons over time that offer variation and daily opportunities to develop fluency and reasoning, we will create a lifelong love for and deep understanding of mathematics in our Cornish school.

APPENDIX



Mastery Lesson Components- S plan



★ 8. Task sequencing:

- Access task for all using representation/ image of manipulatives.
- Variation of a)- can be rehearsal to develop fluency.
- Reasoning opportunity (true/ false, explain, real life problem with explanation required).
- x) Variation to deepen understanding/ looking at LI in variety of ways.
- Greater Depth Mastery Challenge (for rapid graspers only).

K. Rogers

Accredited Professional Development Lead

National Centre for Excellence in the Teaching of Mathematics