SHOBNALL PRIMARY & NURSERY SCHOOL

APPROACH TO THE TEACHING OF MATHEMATICS

"Go down deep enough into anything and you will find mathematics."

SEPTEMBER 2021

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INTRODUCTION

This document outlines the teaching, organisation and management of mathematics taught and learnt at Shobnall Primary & Nursery School.

The document has been drawn up as a result of staff discussion and its implementation is the responsibility of all teaching staff. The responsibility for monitoring and review rests with the mathematics subject leader.

The main purposes of this document are:

- To establish an entitlement for all pupils.
- To establish expectations for teachers of this subject.
- To promote continuity and coherence across the school.

VISION

"At Shobnall Primary & Nursery School, our vision is to enable children to become confident, skilled and resilient mathematicians. We believe that by providing high-quality maths lessons encourages every child to be able to achieve excellence in mathematics. We aspire for children to have a deep understanding of the subject through, concrete, pictorial and abstract approaches by ensuring that our children develop a deep and sustainable understanding of maths. We strive for our pupils to be passionate about mathematics. By ensuring that we offer opportunities for our children to have a balance between declarative, procedural and conditional knowledge. This ensures that our children are able to calculate, reason and problem solve and become proficient mathematicians."

PRINCIPLES

MATHEMATICS			
We believe our children should have fluent knowledge and recall of number facts, formulae and methods.	We promote an enjoyment and enthusiasm for learning through exploration and discussion to develop positive attitudes towards mathematics.	We encourage an understanding of mathematics through a process of fluency, reasoning and problem solving.	We encourage our children to have the ability to think independently and to persevere when faced with challenges in order to become proficient mathematicians.
We promote the knowledge of working both cooperatively, collaboratively and independently.	We encourage our children to embrace the value of learning from mistakes and false starts.	We motivate our children to reason, generalise and make sense of solutions using their long-term knowledge.	We promote the knowledge of an extensive and rich mathematical vocabulary.
We motivate our children to have fluency in performing written and mental calculations, which demonstrate mathematical techniques.	We encourage our pupils to have an extensive knowledge of the important concepts and an ability to make connections within areas of mathematics.	Our children have a broad range of skills in using and applying mathematics as well as an understanding of the importance of mathematics in everyday life.	We believe our children will have the ability to show initiative in solving problems in a wide range of contexts, through decision-making and reasoning.

THEORY UNDERPINNING OUR PRACTICE AND PRINCIPLES

Mathematics is a universal language that enables an understanding of the world and is an integral part of the curriculum. Through mathematics, pupils come to understand that mathematics nurtures the development of a logical and methodical mindset, as well as helping to develop the ability to solve all manner of problems.

Mathematical curriculum knowledge is classified into three types, declarative, procedural and conditional.

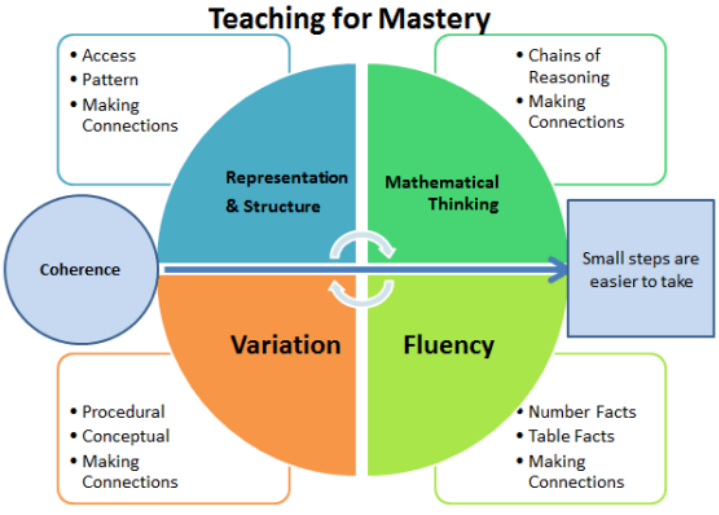
Declarative 'I know that'	Fact and formulae (recall)	Relationship between facts (conceptual understanding)
Procedural 'I know how'	Methods (rehearsal)	Relationships between facts, procedures and missing facts (principles/mechanisms)
Conditional 'I know when'	Strategies (collections of problems with the same deep structure)	Relationships between information, strategies and missing information (reasoning)

Therefore, when pupils use each of these types of knowledge (i.e. declarative, procedural, conditional) their knowledge of the relationship between concepts develops over time.

As a result, pupils need to systematically acquire core mathematical facts, concept, methods and strategies to be able to experience success when problem solving and reasoning in order to become proficient mathematicians. For that reason, careful sequencing of content, instruction and rehearsal ensures that pupils are shown new and consistent patterns of useful information. Which in turn then form the basis of further concepts, rules and principles that pupils can store in their long term memory.

Teaching for Mastery: the principles

Mastering maths means acquiring a deep, long-term, secure and adaptable understanding of the subject. At any one point in a pupil's journey through school, achieving mastery is taken to mean acquiring a solid enough understanding of maths that's been taught to enable them to move on to more advanced material.



Teaching is underpinned by a belief in the importance of mathematics and that the vast majority of children can succeed in learning mathematics in line with national expectations for the end of each key stage.

Research has shown that in order to have a successful curriculum progression it must be planned from the beginning of a pupil's education by focusing on core content, to develop pupils' motivation and to allow more breadth and depth later. As well as ensuring that the planned curriculum details the core facts, concepts, methods and strategies that give pupils

the best chance of developing proficiency in the subject. A great mathematics curriculum should 'help pupils to gain enjoyments through a growing self-confidence in their ability'.

INTENT

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 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 (DFE 2013).

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.

The National Curriculum states that: 'The expectation is that the majority of pupils will move through the programmes of study at broadly the same pace' (DfE Page 99). This, coupled with the teaching for mastery agenda as set out by the National Centre for the Excellence in Teaching Mathematics (NCETM), has encouraged many schools to adopt a full mastery approach, using schemes such as Power Maths and White Rose Maths.

Power Maths is a whole-class mastery programme designed to spark curiosity and excitement and help nurture confidence in maths. At the heart of Power Maths is the belief that all children can achieve. It's built around a child-centred lesson design that models and embeds a growth mindset approach to maths. At Shobnall Primary and Nursery School, we use Power Maths as a basis for our mathematics lesson.

This is an exciting class mastery approach, which is based upon the concrete, pictorial and abstract approach. Experiencing **concrete, pictorial and abstract representations** of a concept during a lesson, strengthens pupils conceptual understanding and fluency. Moving between the concrete and the abstract helps pupils to connect abstract symbols with familiar contexts, thus providing the opportunity to make sense of and develop fluency in the use of abstract symbols (see calculation document for examples).

At the heart of this programme is the idea that all children can achieve and be successful mathematicians with the right growth mindset. It promotes five child friendly characters, each with their own positive skillset, to inspire and motivate children. These characters are:

We have adopted these characters within school as our characteristics of a mathematician.

IMPLEMENTATION

Our curriculum will work to the expectations set out in the framework document for The National Curriculum in England, September 2013 for Years 1 to 6; and the educational programmes in the statutory guidance as well as the non-statutory guidance Development Matters. Our curriculum draws on a variety of resources and best practice, such as those materials published by Power Maths, The White Rose Maths Hub, NRICH, Classroom Secrets, ISeeReasoning, Deepening Understanding, Number Sense and the NCETM.

At Shobnall Primary and Nursery School, we feel the best way to achieve the aims set out by the National Curriculum and the EYFS educational programmes is by adopting a Mastery approach, which is tailored to the children within our school. Our long-term progression map broadly follows the National Curriculum as well as EYFS educational programmes but is adapted to include the teachings of Power Maths, the White Rose Maths Hub and the NCETM.

Each class teacher is responsible for the mathematics in their class in consultation with, and with guidance from, the Mathematics Subject Leader. In mathematics, studies suggest that long-term retrieval of core content should be a focus of teachers' and leader's planning. This means that teachers should set pupils tasks that focus on rehearsal of facts, methods and strategies in addition to tasks that develop pupils' understanding. Teachers plan small steps in learning, enabling deep coverage and mastery of the school's curriculum, through both daily maths lessons and additional opportunities to develop number fluency.

During a sequence of learning, all children will have access to high quality teaching and learning time with their class teacher, who is best placed to help them make progress. Children's next steps in learning are at the forefront of all planning and achievements are clearly reviewed through regular assessments on Classroom Monitor. Occasionally children may spend additional time working with an adult on a one-to-one basis or in small groups, to

close a gap that has been identified in their mathematical understanding and this will be done either during the lesson or prior to the next lesson in a 'Review and Revisit'.

Teachers in the Early Years Foundation Stage base their teaching on the educational programmes in the statutory guidance as well as the non-statutory guidance "Development Matters" to ensure that the children are proficient mathematicians. Research suggests that foundational knowledge, particularly proficiency in number, gives pupils the ability to progress through the curriculum at increasing rates later on. The path of learning that begins with a diligent focus on core declarative and procedural knowledge is not a straight line. This is a function of the curriculum's intelligent design that we have adopted at Shobnall Primary and Nursery School. Additional documentation provided by Power Maths and NCTEM is also used. The Early Years Foundation Stage teachers deliver some whole class teaching and adult focus led Maths activities together with the teaching assistant, each day. The children also access a range of Maths activities within continuous provision.

Maths is taught four times a week with lessons that will last around 60 minutes. Daily maths lessons will involve plenty of discovery, sharing, collaboration, practice and reflection; and will offer learning tasks that use concrete manipulatives and pictorial models to secure understanding. In addition, to further develop fluency, children in Reception to Year 6 have an arithmetical proficiency lesson of between 15-20 minutes every afternoon. As well as, children in Y2-6 will also complete 33 club and access Times Tables Rock Stars for multiplication practice. Also, children in Reception - Y2 will also complete rocket test and access Numbots for subitising and number bond practice.

IMPACT

Pupils at Shobnall Primary and Nursery School understand and value the importance of Mathematics, this is evident through pupil voice and monitoring, which takes place by the Mathematics Subject Leader.

We want our pupils to be confident in making rich connections across mathematical ideas as a result of developing fluency, mathematical reasoning and competence in solving increasingly sophisticated, contextual problems during their time at Shobnall Primary and Nursery School. Our pupils will be able to apply their mathematical knowledge across the curriculum and to realise that mathematics has been developed over centuries. As our pupils progress further in their education, we intend for them to be able to understand the world, have the ability to reason mathematically and to have a sense of enjoyment and curiosity about the subject.

Through first quality teaching, guidance and effective feedback, pupils will:

- Clearly explain their reasoning and justify their thought processes.
- Quickly recall facts and procedures.
- Have the flexibility and fluidity to move between different contexts and representations of mathematics.
- Have the ability to recognise relationships and make connections in mathematics.
- Be happy, confident, articulate and autonomous learners with a life-long passion for learning.
- Leave our school at the end of KS2 prepared for the next step in their mathematical education.

EFFECTIVE TEACHING AND LEARNING IN MATHEMATICS

Effective teaching ensures that pupils retain knowledge they have learned in their long term memory. This is supported by opportunities to revisit and practise their prior knowledge as well as building upon these foundations. Pupils are more likely to retain knowledge when they have engaged with the content they study. Teachers can support learning through clear exposition, which takes into account what pupils already know and understand. However, wider educational research offers a strong basis for a range of effective teaching approaches in mathematics. These are often reflected in our lessons and will include:

- **Mastery** – evidence suggests that in order to have a successful curriculum progression it must be planned from the beginning of a pupil's education by focusing on core content, to develop pupils' motivation and to allow more breadth and depth later.
- **Sequence of learning** – evidence suggests that teachers can support pupils' long-term learning by drawing attention to core facts, formulas, concepts and vocabulary that are useful now and in the next stage of education.
- **Prior knowledge** – teachers' exposition is likely to be most effective when it is clear and carefully designed to account for pupils' existing knowledge.
- **Recall** – The evidence points to the need for teachers to provide enough opportunities to practise taught facts, methods and strategies, as well as additional opportunities for overlearning.
- **Misconception moments** – evidence suggests that teachers and pupils should be aware of infrequent mistakes that can be learned from. Therefore, teachers should ensure that pupils are put on a casual pathway that leads from success to motivation rather than learning from making mistakes. As a result, pupils should be taught about consistent mistakes so that they can experience more understanding, accuracy and success.
- **Differentiation** – research suggests that the large majority of pupils' progress through the curriculum content at the same pace. Differentiation emphasises deep knowledge and individual support/intervention.
- **Mixed ability** – there is a lot of evidence to support that mixed ability groupings in mathematics appears to strongly benefit the majority of pupils as they are able to observe how others approach problem- solving and calculating in mathematics.
- **Questioning** – evidence suggests that teachers use precise questioning to check conceptual and procedural knowledge. They assess in lessons to identify who requires intervention so that all pupils keep up.
- **Working walls** – provide an additional and practical resource within the teaching and learning environment and develop not only the knowledge and understanding of the children but also the practical skills that are vital in the learning process. Modelled examples from the previous lesson or earlier in the lesson can be used as a point of reference to support children's working memory so that they don't have to hold everything in their heads at once.
- **Concrete resources** – are objects or physical resources that pupils can handle and manipulate to aid their understanding of different maths concepts and is a powerful tool for supporting our pupils to engage with mathematical ideas. Teachers and pupils must understand the links between the manipulative and the mathematical ideas that they represent as well as their being a clear rationale for using that particular resource.
- **Calculations and presentation** – research suggests that accurate calculations and careful presentation give pupils the ability to spot important and interesting patterns of number, as well as errors that need to be corrected. Calculation methods and presentation rules are procedural knowledge that need to be taught and rehearsed to automaticity.
- **Live marking** – evidence suggests that pupils are more likely to develop a positive attitude towards mathematics towards mathematics if they are successful in it,

especially if they are aware of their success. As a result, incorporating live marking into the lesson ensures that our pupils are aware of their successes and provide immediate feedback.

- **Homework** – evidence suggests that powerful teaching and learning in the classrooms where pupils do well are supported by regular homework assignments that require pupils to systematically rehearse content at home.

SUPPORTING PUPILS IN MATHEMATICS, INCLUDING PUPILS WITH SPECIAL EDUCATIONAL NEEDS AND/OR DISABILITIES (SEND)

We recognise that in all classes children have a wide range of ability in mathematics, and we seek to provide suitable learning opportunities for all children by matching the challenge of the task to the ability of the child. Research suggests the pupils with SEND benefit hugely from explicit, systematic rehearsal of declarative and procedural knowledge. Teachers use of systematic instruction and rehearsal to help pupils learn planned content over time.

All pupils are entitled to a broad mathematics curriculum. Any adaptations made to support pupils' learning in mathematics usually should not be to the overall curriculum content but rather to how the content is taught. In the case of pupils with the most complex learning needs, there may be occasions when it is appropriate to modify the curriculum. However, this will be the exception.

PROMOTING KEY SKILLS IN MATHEMATICS

Through our teaching of mathematics, we provide opportunities for pupils to develop the key skills of:

Declarative 'I know that'	Fact retrieval (recall)	Explaining relationships between facts (derivation and parsing of number)	Power up, arithmetic sessions, Mastering number programme, discover, think together, homework, TTRockstars, Numbots
Procedural 'I know how'	Methods rehearsal (exercises)	Explaining principles, proving conceptual understanding (such as, use of informal methods, creating bar models and interpreting of context)	Think together, discover, share, we do and you do questions, practice questions, going deeper, homework
Conditional 'I know when'	Strategies rehearsal (collections of problems with the same deep structure)	Describing relations between the problem and the choices of strategy (proof/reasoning)	Misconception moment, reasoning bubbles, discover, practice questions, reflect

EARLY YEARS FOUNDATION STAGE

Early years explore mathematical themes and content through the 'Mathematics' strand of the EYFS curriculum. This will include developing a strong grounding in number so that all of our pupils develop the necessary building blocks to excel mathematically as well as a greater detail on the importance of shapes, spatial reasoning and measure, and how our pupils can foster a love of maths. They are assessed according to the Progress Models determined by the school in accordance with the Statutory Framework for the Early Years Foundation Stage.

KEY STAGE 1

The National Curriculum (2014) states that:

The principal focus of mathematics teaching in Key Stage 1 is to ensure that pupils develop confidence and mental fluency with whole numbers, counting and place value. This should involve working with numerals, words and the four operations, including practical resources (e.g. concrete objects and measuring tools).

At this stage, pupils should develop their ability to recognise, describe, draw, compare and sort different shapes and use the related vocabulary. Teaching should also involve using a range of measures to describe and compare different quantities such as length, mass, capacity/volume, time and money.

By the end of Year 2, pupils should know the number bonds to 20 and be precise in using and understanding place value. An emphasis on practice at this early stage will aid fluency.

Pupils should read and spell mathematical vocabulary, at a level consistent with their increasing word reading and spelling knowledge at Key Stage 1.

LOWER KEY STAGE 2

The National Curriculum (2014) states that:

The principal focus of mathematics teaching in lower key stage 2 is to ensure that pupils become increasingly fluent with whole numbers and the four operations, including number facts and the concept of place value. This should ensure that pupils develop efficient written and mental methods and perform calculations accurately with increasingly large whole numbers.

At this stage, pupils should develop their ability to solve a range of problems, including with simple fractions and decimal place value. Teaching should also ensure that pupils draw with increasing accuracy and develop mathematical reasoning so they can analyse shapes and their properties, and confidently describe the relationships between them. It should ensure that they can use measuring instruments with accuracy and make connections between measure and number.

By the end of Year 4, pupils should have memorised their multiplication tables up to and including the 12-multiplication table and show precision and fluency in their work.

Pupils should read and spell mathematical vocabulary correctly and confidently, using their growing word reading knowledge and their knowledge of spelling.

UPPER KEY STAGE 2

The National Curriculum (2014) states that:

The principal focus of mathematics teaching in upper key stage 2 is to ensure that pupils extend their understanding of the number system and place value to include larger integers. This should develop the connections that pupils make between multiplication and division with fractions, decimals, percentages and ratio.

At this stage, pupils should develop their ability to solve a wider range of problems, including increasingly complex properties of numbers and arithmetic, and problems demanding efficient

written and mental methods of calculation. With this foundation in arithmetic, pupils are introduced to the language of algebra as a means for solving a variety of problems. Teaching in geometry and measures should consolidate and extend knowledge developed in number. Teaching should also ensure that pupils classify shapes with increasingly complex geometric properties and that they learn the vocabulary they need to describe them.

By the end of year 6, pupils should be fluent in written methods for all four operations, including long multiplication and division, and in working with fractions, decimals and percentages.

Pupils should read, spell and pronounce mathematical vocabulary correctly.

PLANNING AND RESOURCES

Long term planning
Power Maths, the White Rose Maths Hub and the Ready-to- progress schemes of learning provide the long term planning for mathematics taught in our school.

In Nursery, the children follow a bespoke long term plan as outline by the statutory and non-statutory guidance outlined by the educational programmes for EYFS as well as incorporating the teaching from the NCETM and using Numberblocks as a stimulus.

Medium term planning
In Reception to Year 6, teachers use Power Maths as a framework based upon the CPA approach (concrete, pictorial and abstract). They support a mastery approach to teaching and learning and have number at their heart as well as ensuring teachers stay in the required key stage and support the ideal of depth before breadth. Within a lesson there are periods of independent practice using practice books and mathematics books. Children are encouraged to “Discover” – show how they are able to solve a mathematical concept; “Share” listen to the range of representations that may be used and “Think Together” by applying their developing understanding through scaffolded questions until they have grasped the concept. Teachers are also encouraged to stretch and challenge the children within their class by using a variety of resources and best practice, such as those materials published by Power Maths, The White Rose Maths Hub, NRICH, Classroom Secrets, the NCETM, Maths on Target, Number Sense, Deeping Understanding, ISeeReasoning etc.

Short term planning
The above schemes of learning support daily flipchart planning. Lessons are planned using a common planning format and are monitored at intervals by the mathematics subject leader. Each flipchart is structured the same way across the school.

- Date, objective, pre-learning expectations and key vocabulary
- Power up
- Discover – the main question is written in black and the questions taken from the teacher guide are red. Reasoning stems are written in purple to aid the children’s reasoning answers.
- Share - questions taken from the teacher guide are red.
- Think together – I do, we do and you do questions. Reasoning stems are written in purple to aid the children’s reasoning answers.
- Practice – Three form of differentiation (Mild, Hot and Flamin’) with each group completing two tasks. Mild task 1 is to incorporate strengthening and Flamin’ Task 2 is to incorporate going deeper tasks outlined in Power Maths. Each group must be taught a reasoning stem at least once a week, which is displayed on the reasoning bubbles.
- Reflect – a reflection question based on what has been learned during the session.

- Development sticker- varied fluency, reasoning and problem solving.
- Development stickers answers.

All flipcharts are to be saved in the subsequent year group folders within the maths folder that are on the T: drive. Within each year group folder there is a main folder with the unit number and title e.g. Unit 8- Fractions. Inside the folder is the downloaded and saved documents from the Power Math website (deepening activities, stretch and challenge, power up answers, practice book answers as well as the unit guide) as well as the White Rose Scheme for the corresponding unit. Also, sub folders for each individual lesson, which include the flipchart for that lesson, power up (downloaded and saved) as well as any other resources need to support the lesson e.g. WR premium resources or worksheets you have made to accompany the lesson and development stickers.

Teachers of the EYFS ensure the children learn through a mixture of adult led activities and child initiated activities both inside and outside of the classroom. Mathematics is taught through an integrated approach.

Resources

Each class has a stock of core resources that are age appropriate stored in their maths trolley in each classroom. This ensures that maths equipment and resources are easily accessible to the children during lessons. Additional mathematical equipment and resources are stored centrally in the resources room. The maths subject leader is responsible for the management and maintenance of maths resources, as well as for liaising with SLT in order to purchase further resources.

Working walls will be utilised and updated regularly, in accordance with the area of maths being taught at the time as well as including maths vocabulary and reasoning and problem solving sentence starters as well as worked examples. The maths subject leader will undertake an audit of maths equipment and resources on an annual basis.

Arithmetical proficiency

At Shobnall, an increased focus on arithmetic proficiency (an appreciation of number and number operations, which enables mental calculations and written procedures to be performed efficiently, fluently and accurately) is paramount to ensure that our children have a broad range of mathematical skills to ensure they are fluent in the fundamental of Mathematics. Teacher and pupils follow an arithmetical long term plan which incorporate the revisiting of core content so that our pupils are able to be proficient mathematicians

Mixed ability

Children have a wide range of mathematical abilities. At Shobnall, we deliver maths sessions in mixed ability classes. Where possible, children work in mixed ability pairs, particularly when exploring strategies to solve a problem- this benefits all learners. Confident mathematicians are challenged through further questioning. Teachers and LSAs provide support and to ensure that work is matched to the needs of individual.

Differentiation

Activities are differentiation into three criteria (Mild, Hot and Flamin'). At Shobnall, we are geared towards enabling each child to develop their learning without labelling them by ability. Children are encouraged and supported by the teacher to select work according to their ability in that particular area of maths. Teacher will then move a child on to new tasks and challenges if appropriate. Mastery focuses on ensuring pupils work through the curriculum at the same pace. However, work is appropriately differentiated to meet the needs of individual pupils

including Special Educational Needs and more able children. Resources are therefore differentiated, modified and used imaginatively to support or challenge learning, and LSAs play a valuable part in supporting the effective delivery of daily mathematics lessons for all pupils. Every effort is made to support all children in achieving their targets. If children are struggling with a concept in a maths lesson, then further interventions will be needed in the form of 'Revisit and Review' (RR). RRs should take place either during the lesson or prior to the next lesson beginning so that children 'catch-up and keep-up' with the curriculum.

Marking

Work is marked according to our School Marking Document and indicates whether or not the Learning Objective have been achieved. Some maths work may be marked during the lessons by pupils or teachers to identify the amount of progress being made. If a child has a misconception during this will be addressed in red pen so that it is clear to see if this has been corrected. A red pen will also be used when completing TGs. Whereas if a child if completing a separate challenge e.g. a development sticker, these will be addressed using a green pen.

CROSS-CURRICULAR OPPORTUNITIES

Staff are encouraged to develop cross-curricular links with mathematics and other subjects to provide a relevant and meaningful curriculum for pupils.

English
Mathematics contributes significantly to the teaching of English in our school by actively promoting the skills of reading, writing, speaking and listening. Children develop oracy through discussing mathematical questions, or presenting their reasoning's to the rest of the class and/or partner.

History
The teaching of mathematics contributes to children's historical understanding in a variety of ways. Children learn to use numbers when developing a sense of chronology through activities such as creating timelines and through sequencing events in their own lives. Children also learn to interpret information presented in graphical or diagrammatic form. They also study different number systems from past cultures, e.g. Roman numerals.

Geography
Mathematical ideas are present in most geography lessons and pupils can apply their mathematical skills to extend their geographical understanding. Effective maths skills are vital in many aspects of the subject. For example, numbers for measurement, e.g. temperatures, percentages, distances, river flow, numbers as coordinates e.g. grid references and latitude/longitude, comparative data e.g. ratios such as population density or GNP

Science
The teaching of science contributes to the children's mathematical understanding in a variety of ways to interpret information presented in graphical or diagrammatic form as well as being able to deepen their mathematical reasoning when selecting the correct method or formulas to solve a problem.

Art
The teaching of art allows for the understanding of fractions, proportion and shape to be used within a real-life context that is enjoyable and thought provoking for our pupils.

Design and technology (DT)

The teaching of DT contributes to the children's mathematical understanding in a variety of ways to interpret information presented in numerous way. This allows our pupils to systematically rehearse content taught as well as developing an ability to solve all manner of problems. DT allows for children to rehearse their understanding of shape, space and measure as well as number.

Computing
Wherever appropriate we use computing to enhance our teaching of mathematics. The children use ICT in a variety of ways, such as creating spreadsheets and coding.

ASSESSMENT

Assessment is an integral part of teaching and learning and is a continuous process. Teachers make assessments of children daily through

- regular marking of work
- analysing errors and picking up on misconceptions
- asking questions and listening to answers
- facilitating and listening to discussions
- making observations

These ongoing assessments inform future planning and teaching. Lessons are adapted readily and short term planning evaluated in light of these assessments. Pupils attainment and progress in mathematics is recorded by teachers using Classroom Monitor to inform parents and future teaching and learning activities.

Medium term
At the beginning of every unit a starting flipchart is taught and the class teacher makes observations to see whether or not the child/children are ready to start the unit or if they need any pre-teaching before commencing the unit. At the end of the unit the children will complete an end of unit check. If children are secure and answer all the questions correctly, they complete deepening activities while the class teacher works closely with the children who are not yet secure by using the strengthening activities to ensure misconceptions and gaps are plugged.

Pupil Progress meetings are timetabled each term for all classes. Progress of pupils is discussed and appropriate intervention considered and put in place where appropriate.

Long term
Termly assessments are carried out across the school using the assessment materials for each year group provided by the NTS and is in line with the schemes of learning. These materials used alongside judgements made from class work support teachers in making a steps assessment for each child which in line with the assessment document

Year 2 and Year 6 complete the national tests (SATs) in May as well as Year 4 completing the multiplication check in June.

HEALTH AND SAFETY

We enable all pupils to have access to the full range of activities involved in learning mathematics. Where children are to participate in activities outside the classroom, teachers should be aware of health and safety issues. Risk assessments are undertaken prior to activities, to ensure that they are safe and appropriate for all pupils. Before undertaking a field trip, teachers are encouraged to visit the proposed area of study and fill in a risk assessment

form. Further information can be found in the Health and Safety and Wellbeing Document and Educational Visits Document.

SAFEGUARDING AND CHILD PROTECTION

We seek to safeguard children and young people by:

- valuing them, listening to them and respecting them;
- adopting child protection guidelines through procedures and a code of conduct for staff and volunteers;
- recruiting staff and volunteers safely, ensuring all necessary checks are made;
- sharing information about child protection and good practice with children, parents, staff and volunteers;
- sharing information about concerns, with agencies who need to know, and involving parents and children appropriately;
- providing effective management for staff and volunteers through supervision, support and training.

See Safeguarding and Child Protection Document for further information.

MONITORING AND REVIEW

It is the responsibility of the mathematics subject leader:

- supports colleagues in their teaching, by keeping informed about current developments in mathematics and by providing a strategic lead and direction for this subject;
- to develop, implement and review an action plan for mathematics;
- to monitor mathematics throughout the school;
- to encourage staff to provide effective learning opportunities for all pupils;
- to develop valid activities, appropriate for children at different stages of development, which enable pupils to progress in the subject.

Monitoring of the standards of children's work and of the quality of teaching in mathematics is the responsibility of the mathematics subject leader. The work of the subject leader also involves supporting colleagues in their teaching, being informed about current developments in the subject, and providing a strategic lead and direction for the subject in the school.

This document will be reviewed at least every three years.