Tregoze
· Primary School ·
Inspire · Motivate · Challenge

Tregoze
Mathematics Policy

Status and review cycle: Legally Required Bi-Annual review required

Reviewed: LBG

Ratified by governors on: March 2019
Next review date: March 2020

Tregoze Primary School is a values based school. It has a knowledge led, broad and balanced curriculum which is taught through topic and high quality texts. We place a high emphasis on global citizenship.

At Tregoze Primary School we recognise the central importance of Mathematics and it is given a high priority in the school. It is a core subject within the National Curriculum and a pre-requisite for educational and social progress. Pupils come to Tregoze with varying degrees of knowledge about mathematics and we build upon this knowledge, providing opportunities to develop an enthusiasm for the different aspects of Mathematics.

At Tregoze Primary School we offer a Maths curriculum which aims to develop a deep and secure understanding. We believe that it is our duty to ensure that children have a solid and concrete understanding of Mathematics skills. We also believe that children should be given the opportunity to solve problems involving mathematics and should be encouraged to embrace challenge. As a result of this we spend a great time securing the National Curriculum objectives and all lessons provide opportunities for the children to develop their fluency, and reasoning and problem solving skills. This approach to Mathematics teaching ensures that ALL children master and secure their maths learning and knowledge before moving on. We firmly believe that ability is not fixed and this approach means that all children are offered the same opportunities and chances to achieve.

All children are taught maths daily but we also offer a discrete number sense session daily. This is a short session, in which the children work on their knowledge of addition, subtraction, multiplication and division, with the aim of developing fluency.

Aims and intentions

-to teach less but learn more, through focusing on the appropriate curriculum content only but in more depth.

-to give all children the opportunity to travel on what is broadly the same journey and at a similar pace, giving all children the chance to master and secure their maths learning and knowledge before moving on.

-to be flexible, responsive and reactive to learning to ensure that all children are supported and challenged.

-to value mistakes and expose difficulty points.

-to encourage children to challenge themselves in Mathematics and to persevere when faced with a challenge.

-to teach for a 'secure and deep' understanding through developing fluency, reasoning and problem solving skills.

-to enable children to 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.

-to support children to reason mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language.

-to encourage children to solve problems by applying their Mathematics to a variety of routine and non-routine problems with increasing sophistication, and to apply Mathematics to real life situations.

Organisation

Maths is allocated to 5 to 6 hours a week. Each week, four/five Maths sessions are taught with opportunity for reinforcement of skills, appropriate to the needs of the children.

In addition to the Maths sessions, a number sense session of 15-20 minutes takes place daily, where children will work on their knowledge of addition, subtraction, multiplication and division, with the aim of developing fluency. These sessions are often very practical and will include games and oral work. This time can also be used to allow time for intervention following the whole class session in the morning, should this be appropriate for either the whole class or small groups.

Planning

Mathematics is a core subject in the National Curriculum, and we use the National Curriculum objectives and programmes of study as the basis for implementing the statutory requirements. Teachers follow the White Rose schemes of learning to ensure that they are allowing children with opportunities to develop their fluency, reasoning and problem solving skills. These schemes include an overview for the year which sets out the learning for the year into teaching blocks which ensures that the appropriate curriculum is covered over the course of the year. However, this overview can be used flexibly as appropriate for the class. The scheme also includes a document for each teaching block which provide questions and activities to support fluency, reasoning and problem solving, which teachers use to plan and resource their lessons. Teachers also make use of a number of other resources to enhance the lessons and ensure that children are challenged appropriately, such as Arithmekit and NCETM. Short term, weekly planning outlines stimulating and challenging activities to meet the objectives and is planned using note book. Each Mathematics lesson contains whole class teaching, independent activities and discussion time. Opportunities for pupils to use and apply their mathematical skills and understanding are built into lessons as appropriate in line with the New Primary Curriculum objectives. In each week four or five mathematics sessions are taught with the opportunity for the reinforcement and development of the skills and knowledge being covered.

Teaching and Learning

At Tregoze we:
-promote enjoyment and enthusiasm for learning through practical activity, exploration and discussion;
-promote confidence and competence with numbers and the number system;
-develop rich connections across mathematical ideas to develop fluency, mathematical reasoning and competence in solving increasingly sophisticated problems.
-apply mathematical knowledge to Science and other subjects.
-develop a practical understanding of the ways in which information is gathered and presented;
-explore features of shape and space and develop measuring skills in a range of contexts;

The school uses a variety of teaching and learning styles in mathematics lessons to develop pupils' knowledge, skills and understanding in mathematics.

The expectation is that the majority of pupils will move through the programmes of study at broadly the same pace. Decisions about when to progress are based on the security of pupils' understanding and their readiness to progress to the next stage. Pupils who grasp concepts rapidly are challenged through being offered rich and sophisticated problems to deepen their understanding before any acceleration through new content. Those who are not sufficiently fluent with earlier material consolidate their understanding. This can be through extra intervention outside of the lesson or adult support within the lesson with the aim to master the objective.

We do this through lessons that have a high proportion of whole-class teaching, which focus on developing fluency, reasoning and problem solving skills. This is followed by children completing fluency and reasoning activities. The expectation is that the majority of children will complete these activities. To deepen the learning, children will complete a problem solving activity.

If support is needed, pupils have the opportunity to use a wide range of resources such as: number lines, number squares, digit cards and small apparatus to support their work. Teaching assistants support groups or individuals in the lesson. Pupils also sit in mixed ability pairings. They use ICT in mathematics lessons to enhance or support their learning such as: Interactive games on IPads, SATs online, and the Smartboard. Working walls are used within lessons to help and support children with their independent learning and progression. Key vocabulary, modelling and examples (think, explain, prove) are displayed.

In addition to the mathematics lessons, all children from Year 1 onwards compete in the 99 club to secure their times tables

Reception and Key Stage 1

In Key Stage 1 children continue to develop their mathematical knowledge and strategies. Developing number knowledge is hugely important and they will focus on:

- Counting, reading and writing numbers to 100 in numerals and words
- Representing numbers in different ways
- Understanding the place value of numbers to 100
- Finding one more and one less
- Identifying odd and even numbers
- Comparing numbers using less than, greater than and equal to symbols

Children in Key Stage 1 will also learn about addition, subtraction, multiplication and division and will learn a variety of strategies to help them find answers. They will focus on:

- Adding and subtracting numbers using a wide range of strategies
- Learning number bonds to 20
- Understanding that addition can be done in any order and that there is a relationship between addition and subtraction facts
- Counting in 2, 5, 10 and 3 and will work towards learning these time tables
- Learning a range of strategies to solve multiplication and division
- Recognising, finding and naming ½, ¼ and ¾ of shapes, objects, lengths and quantities

It is also important that children in Key Stage 1 continue to develop their understanding of shape, space and measure. They will focus on:

- Recognising and describe the properties of 2D and 3D shapes
- Using mathematical vocabulary to describe position, direction and movement. A Describing, ordering, comparing and measuring length, height, mass and capacity
- Recognising coins and to using them to make amounts
- Telling the time when it is o'clock, half past, quarter past and quarter to
- Using data to draw tally charts, block graphs, tables and pictograms

Key Stage 2

In Key Stage 2 children continue to build upon their learning from Key Stage 1.
Number continues to be of high importance in Key Stage 2. Children focus on;

- Counting, reading and writing numbers to 10,000,000 in numerals and words
- Representing numbers in different ways
- Understanding the place value of numbers to 10,000,000
- Finding more and less of numbers
- Comparing numbers using less than, greater than and equal to symbols
- Comparing fractions, decimals and percentages and use these in relation to number

- Solving problems involving finding ratios of numbers
- Developing their knowledge of algebra and use this to solve problems

Addition, subtraction, multiplication and division continue to be a big focus in Key Stage 2. Children continue to learn a wide range of strategies to help them to find answers, using resources, pictorial representations and by mentally calculating answers. They will focus on;

- Adding and subtracting numbers using a wide range of strategies
- Learning a range of strategies to solve multiplication and division
- Counting in multiples and learning times tables up to 12x12, with the aim of knowing these securely by Year 4
- Recognising, finding and naming different fractions of shapes, objects, lengths and quantities

Shape, Space and Measure continues to be a big area of focus in Key Stage 2. The children will focus on:

- Recognising and describing the properties of 2D and 3D shapes
- Finding the length, perimeter, area and volume of different shapes
- Using, reading, writing and converting between standard units and measurements
- Using mathematical vocabulary to describe position, direction and movement
- Describing, ordering, comparing and measuring mass and capacity
- Estimating, comparing and calculating amounts using coins
- Telling the time confidently
- Using data to draw charts and graphs, and finding the mean, median and mode of numbers

Children in Key Stage 2 also focus largely on investigations and problem solving.

It is the class teacher who creates Smart Files for each lesson, which include a specific learning objective for each lesson, a hook, models, activities and success criteria, which are in the form of 'I can' statements. The class teacher and subject leader may discuss them on an informal basis. The subject leader and leadership team review the weekly Smarts in line with the monitoring schedule.

At the planning stage, teachers plan effective teaching opportunities for all pupils by:

- Setting suitable learning challenges
- Responding to pupil's diverse needs.
- Overcoming potential barriers to learning and assessment for individuals and groups of pupils.

<u>EYFS</u>

We teach Mathematics in our reception class. As the class is part of the Early Years of the National Curriculum, we relate the mathematical aspects of the children's work to the Early Learning Goals, which underpin the curriculum planning for the children aged three to five. We give all the pupils ample opportunity to develop their understanding of number, measurement, pattern, shape and space through varied activities that allow them to enjoy, explore, practice and talk confidently about mathematics. Children will engage in short, whole class teaching of Mathematics daily and will then be given opportunities to experience Mathematics in their rich learning environment, through play.

<u>Resources</u>

There are a range of resources to support the teaching of mathematics across the school. Making use of practical resources is valued highly at Tregoze. All classrooms have a wide range of appropriate small apparatus, and other larger apparatus is stored in the resources cupboard. Resources used include mirrors, rulers, protractors, tracing paper, clocks, numicon, dienes, tens frames and cubes. Calculators are in all Key Stage 2 classes. The library contains a range of books to support the pupils individual research. Whilst using the computers a range of software is also available to support maths work and apps on the IPads.

Monitoring and evaluating

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

The subject leader is responsible for writing the Mathematics action plan as part of the School Improvement Plan. Areas for focus during the current academic year are identified. At the end of the academic year the subject leader is responsible for identifying areas of strength and areas for development in the teaching and learning of Mathematics across the school.

Teachers meet termly with the Head teacher/Leadership team to discuss individual pupil progress and targets in mathematics. This is fed to the subject leader and informs further support and intervention with the delivery of the Mathematics curriculum.

A named member of the school's governing body is briefed to oversee the teaching of Mathematics within the school. This governor meets regularly with the subject leader and/or head teacher to review progress.

The Mathematics coordinator and Head teacher meet at the beginning and end of a term to agree and review a termly action plan for monitoring and evaluating. Key issues are identified and a detailed outline of monitoring activities are discussed and agreed with all staff.

Monitoring, Evaluation and Review takes the form of the following:

- observations of teaching
- review of teachers weekly planning
- information from progress meetings
- scrutiny of written work.
- whole school moderation
- analysis of data e.g. SAT's results, end of term and unit assessments
- staff meeting, Key Stage meetings to ensure consistency of approach, standards of expectation.

Assessment

We assess pupils work in mathematics from three aspects (long term, short-term and medium term). We make short-term assessments which we use to help us adjust our daily plans, through marking in the moment. Wherever possible, and certainly in the early stages, marking takes place alongside the child. Children are encouraged to edit their work and correct mistakes within the lesson, wherever possible.

We complete medium-term assessments at the end of each term, to measure progress against the unit objectives, and to help us to plan the next unit of work. These are made following end of unit and end of term assessments, which closely match the teaching which the children have experienced. We use pupil asset to then track progress termly and to identify children who may need intervention. This involves the identification of children's progress against their year group targets. The teacher will assess whether or not the child is working below the age related standard, at the age related standard or above the age related standard.

We complete formal assessments at the end of the year to assess progress against school and national targets. We can then set targets for the next school year and make a summary of each pupils' progress before discussing it with parents. We pass this information on to the next teacher at the end of the year, so that he/she can plan for the new school year. We make a long-term assessment based on the national tests and teacher assessment using pupil asset. We use learning journals alongside the early years emerging, expected and exceeding outcomes and development matters to assess pupils throughout Reception and into Year 1

(where appropriate). Formal, summative assessments are carried out at the end of Key Stage 1 and 2 in accordance with the National Curriculum assessment requirements.

Contribution of mathematics to teaching in other curriculum areas

English

Mathematics contributes significantly to the teaching of English in our school by actively promoting the skills of reading, writing, speaking and listening. For example, we encourage children to read and interpret problems in order to identify the Mathematics involved. Younger children enjoy stories and rhyme that rely on counting and sequencing. Older children encounter mathematical vocabulary, graphs and charts when using non-fiction texts.

Information and communication technology (ICT)

ICT enhances the teaching of mathematics and offers exciting ways to impact learning. Software can be used to present information visually, dynamically and interactively in a format pupils can readily access. Children use and apply mathematics in a variety of ways when solving problems using ICT software such as Purple Mash and TT Rockstars. Younger children use ICT to communicate results with appropriate mathematical symbols. Older children use it to produce graphs and tables when explaining their results or when creating repeating patterns, such as tessellations. All children are given the opportunity to work on the interactive whiteboard during lessons.

Personal, social and health education and citizenship (PSHE and C)

Mathematics contributes to the teaching of PSHE and C. The work that pupils do outside their normal classroom lessons encourages independent study and helps them to become increasingly responsible for their own learning. The planned activities that the pupils do within the classroom encourage them to work together and respect each other's views. We present older pupils with real-life situations in their work on the spending of money.

Social, Moral, Spiritual, Cultural

In Maths lessons the pupils are encouraged to delve deeply into their understanding of Mathematics and how it relates to the world around them. Our Maths teaching actively encourages risk taking which enables pupils to explore and try new ideas without the fear of failure. This is fundamental to building pupils' self-esteem within Mathematics.

Throughout history, the study of Mathematics stems from intrigue and curiosity, with people's desire to pose and solve problems relating to the real world or purely within mathematics itself. We aim for our students to appreciate this and use their own Maths to explore and question the way the world works and also to apply their reasoning to puzzles for their personal satisfaction.

Spiritual

-developing deep thinking and questioning the way in which the world works promotes the spiritual growth of our students.
-we are sensitive to the pupils' individual needs and backgrounds and experience.
-we aim to give all pupils an appreciation of the richness and power of maths.
-maths in Nature is embedded in Sequences, Patterns and Symmetry
-we promote a sense of wonder in the exactness of mathematics in the exploration of number and real world examples.
-we encourage the pupils to appreciate the enormity of the world of maths as it has developed through time.

Moral

-within the classroom, we encourage respect, reward good behaviour. We value listening to others views and opinions on problem solving.
-we promote discussion about mathematical understanding and challenge assumptions, supporting students to question information and data that they are presented with.
-we show the pupils that we are on a quest for truth by rigorous and logical argument and discourage jumping

to conclusions.
-we explore and evaluate the use of statistics in society

Social

-in classrooms, we look for opportunities for pupils to use mini-whiteboards to promote self-esteem and build self-confidence.
-we encourage collaborative learning in the classroom – in the form of listening and learning from each other and paired discussion / working partners.
-we help pupils develop their mathematical voice and powers of logic, reasoning and explanation by offering explanations to each other.
-we exhibit pupils work in maths classrooms - to share their good practice and celebrate achievement through creating informative displays.
-we participate annually in Federation and County challenges. We also have a maths open mornings.

Cultural

-we share the appreciation with the pupils that mathematics, its language and symbols have developed from many different cultures around the world: eg Egyptian, Greek and Roman.
-we investigate and research cross cultural patterns – tessellation, islamic tiling.

Mathematics and Inclusion

We teach Mathematics to all pupils, whatever their ability. It is part of the school curriculum policy to provide a broad and balanced education to all children. We strive to meet the needs of pupils with special educational needs, those with disabilities, those with special gifts and talents and those with English as an additional language.

When progress falls significantly outside the expected range the pupil may have special educational needs. Our assessment process looks at factors such as classroom organization, teaching materials, differentiation and teaching styles so we can take additional or different action to enable the pupil to learn more effectively. Assessment against the National Curriculum allows us to consider pupils' attainment and progress against age related expectations.

Intervention will lead to the children being on a provision map for the class. Pupils who are School Action Plus or Statemented will have an EHCP. Pupils will be placed on the Special Educational Needs register and may have a specific target related to mathematics.

Provision is made for gifted and talented children through the use of differentiation within the class, where they are set questions or activities to deepen their understanding. The class teacher will broaden the pupils' mathematical experiences through problem solving and investigative learning activities. At Tregoze we seek to challenge our high attainers and every lesson will include both a scuba and submarine activity which will give them an opportunity to deepen their learning and problem solve.

Equal opportunities

Our aim as a staff is to ensure that all children have equal access to a rich and rewarding curriculum for Mathematics, and that they experience this curriculum in ways, which are appropriate for their needs. Consequently, we will make use of a suitable range of learning activities, teaching strategies, educational materials and technological aids to meet the needs of the individual learner. Every effort will be made to ensure that the methods and materials used are free from prejudice or bias against any particular group. Children for whom English is not the first language will be supported in their use of English and will be given opportunities to make use of their home language to assist their learning and to add to the resources of the classroom. Every effort will be made to ensure that these children's cognitive ability is taken into account when we assess these second language user's work.

The role of parents/carers and community involvement

We see parents/carers as crucial partners in the process of developing children's language skills.

- They have a shaping influence on children's Mathematical skills before they come to school and throughout their school life.
- They provide valuable support at home in helping children to become fluent with number, for example counting and times tables.

We inform parents termly, of the Maths objectives that will be taught. In parent/teacher discussions we discuss children's Maths targets. In Key Stage 1 and 2 children are asked to practise number bonds and times tables at home, using online games, such as Times Table Rockstars. Children may be given Maths homework in addition to this.

Written By: Gabriella Sykes

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School: Tregoze Primary

Principal: Helen Tudor

Name of Governor: